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Research Group, Inc., Atlanta, GA

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FLOODPLAIN DEVELOPMENT PRESSURES AND FEDERAL PROGRAMS, PART II:
METHODS USED BY FEDERAL PROGRAMS
TO REDUCE FLOODPLAIN DEVELOPMENT PRESSURES

prepared for the

Office of Federal Activities
U.S. Environmental Protection Agency

by

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16. ABSTRACT

The individual and combined effects of federal programs on development in floodplains are identified. Based on those findings, ways are recommended in which the '201' Wastewater Treatment Works Program of the Environmental Protection Agency can reduce floodplain development pressures. Major tasks in developing those recommendations:

(1) Thirty-one case studies of the impact of federal programs on floodplain development were completed in the Southeast, West, and Midwest regions. Interviews with planning directors and other knowledgeable persons at the local government level provided the basic information;

(2) Meetings with the EPA Regional Offices in Atlanta, Kansas City and Denver were held to review present methods for implementing floodplain policy related to '201' wastewater treatment facilities;

(3) Federal programs which potentially can affect floodplain development were reviewed to identify the range of methods and approaches presently used to mitigate floodplain development pressures; and

(4) Major decision points in the '201' Wastewater Treatment Works Program which can affect floodplain impacts were identified, based on a review of program regulations and guidance materials.

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METHODS USED BY FEDERAL PROGRAMS TO REDUCE FLOODPLAIN DEVELOPMENT PRESSURES

prepared for the

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May, 1978

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CHAPTER ONE

AN INTRODUCTION TO FEDERAL PROGRAMS AND FLOODPLAIN IMPACTS

A. Introduction

In the past several years, management of floodplain areas has become an increasingly important concern for government agencies. There have been two major causes for this concern. First, homes and businesses located in floodplain areas have, on occasion, been severely damaged by floods and, as a result, the federal government has paid for costly flood relief emergency programs.

The second concern leading to the interest in floodplain management relates to the natural values and function of the floodplain. Floodplains adjacent to coastal shores and rivers are inter-connected with the river or ocean. Waters spread over the floodplain during times of flood depositing nutrient-rich sediments which enrich the floodplain. Pollutants which would otherwise damage fish and wildlife of the river system also settle from the river waters. Floodplain vegetation absorbs floodwaters and reduces possible flooding damage downstream.

Actions of federal, state and local government agencies affect development in the floodplain. Construction projects such as homes, industrial parks and waste treatment facilities are sometimes located in the floodplain and contribute directly and indirectly to further urban development of the floodplain. Other government programs regulate development in the floodplain, provide for environmental reviews of proposed projects, or encourage environmental planning.

Urban development can affect the natural values of floodplains in several ways. Development can increase the amount of runoff and discharges carrying pollutants to the river or ocean, block the flows of floodwaters, and endanger life and property. These potential environmental problems do not necessarily mean that development must, in all cases, be located outside of floodplains. Instead, the floodplain is an area where the impacts of development should be reviewed and appropriate actions taken to reduce the impacts.

The U.S. Environmental Protection Agency provides financial assistance for the construction of waste treatment plants and major interceptor sewers which, for engineering reasons, are often located in floodplains. Facilities planning, engineering design, and construction are undertaken by agencies through the '201' Wastewater Treatment Works Program, authorized through Section '201' of the Federal Water Pollution Control Act Amendments (P.L. 92-500). The '201' Program can affect floodplains by providing wastewater treatment service to existing and new urban development. Without treatment facilities, it is often not possible for development to take place. Although treatment facilities help to reduce discharges into surface waters, the development serviced by the treatment facilities can destroy or adversely affect natural values of floodplains.

The U.S. Environmental Protection Agency, in its administration of the '201' Program, uses several types of administrative measures for identifying and reducing the environmental impacts of waste treatment facilities upon floodplains. The use and effectiveness of the floodplain impact mitigation measures, however, are, in some respects, dependent on and affected by the actions of other federal agencies. For example, floodplain development and adverse environmental impacts may be created inadvertently by one federal program. In such cases, the actions of other federal agencies to reduce floodplain impacts may not be successful.

In addition, there is always the possibility for linking programs together such that a successful floodplain impact mitigation measure of one federal program becomes a mitigation measure for other federal programs. A related concept is the exchange of effective floodplain impact mitigation measures among federal agencies.

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[1] This study was completed before final regulations for the Construction Grants Program were issued in response to the 1977 Clean Water Act. See Federal Register, Vol. 43, No. 188, Wednesday, September 27, 1978 for the updated regulations. While the new regulations substantially change parts of the Construction Grants Program, the basic structure has not changed enough to invalidate the recommendations in Part I of this report.

This report provides background information for the U.S. Environmental Protection Agency to use in its continuing review of methods and measures for reducing environmental effects of waste treatment facilities.

B. Overview of the Report

This report describes federal programs which can affect the floodplain and floodplain impact mitigation measures used in federal programs. In addition, major decision points in the '201' Wastewater Treatment Works Program which relate to the effect of the '201' Program on floodplain development are assessed and floodplain impact mitigation measures potentially applicable to the '201' Program are identified. This information will be used in a later stage of this study to identify ways in which existing or new floodplain impact mitigation measures can be used by the Environmental Protection Agency in the '201' Wastewater Treatment Works Program.

The report is organized in five chapters:

Chapter I:	An Introduction to the Report and A History of Federal Government Efforts to Protect Floodplains;
Chapter II:	A Description of Federal Programs Which Can Affect Floodplains;
Chapter III:	An Identification of Floodplain Impact Mitigation Measures Used in Federal Programs;
Chapter IV:	An Assessment of Decision Points in the '201' Wastewater Treatment Works Program Related to Floodplain Impacts; and
Chapter V:	An Identification of Floodplain Impact Mitigation Measures From Other Federal Programs Which are Applicable to the '201' Wastewater Treatment Works Program.

Information was obtained through interviews with representatives of federal agencies, and through a review of federal program regulations and guidelines.

This report constitutes Phase I of a two-phase study for the Office of Federal Activities, U.S. Environmental Protection Agency. The second phase of the study will document a series of thirty case examples of floodplain development and federal agency programs. The relationship of federal programs to floodplain development as viewed by local planning directors will be documented. Finally, recommendations will be made to the U.S. Environmental Protection Agency concerning the use of floodplain impact mitigation measures by the '201' Wastewater Treatment Works Program. The use of mitigation measures should be related to the causes of floodplain development and may be influenced by activities of other federal agencies.

C. Definition of Floodplain and Wetlands

As defined by the Water Resources Council, a "floodplain" is a relatively flat area or lowlands adjoining the channel of a river, stream, wetland, or ocean which has been or may be covered by flood water. In order to precisely define the geographic extent of the floodplain, however, a standard indicating the level of flooding which will inundate the referenced floodplain is needed. Typically, this is expressed in terms of the potential for flooding in a one-year period.

The definition of the standard flood used in the National Flood Insurance Program of the Department of Housing and Urban Development will be used throughout this study. Specifically, the floodplain is defined as the flood area with one chance in 100 of being exceeded in any future one-year period. The floodplain with a one percent chance of flooding each year is equivalent to the "100-year" floodplain. Extensive technical assistance is available to federal, state and local agencies in defining the floodplain. Technical assistance programs are not reviewed in this study.

The Water Resources Council has defined wetlands as being those areas inundated often enough to support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.

Although there are some isolated wetlands areas which are not adjacent to lakes, oceans, estuaries, rivers, or streams, in most cases, wetlands are an integral part of the floodplain. Typically, wetlands vegetation (such as forested swamps, fresh marsh, salt marsh, or mangroves) is located directly adjacent to the river or estuary. In most areas, the floodplain includes wetlands areas, and in some cases, extends beyond the area of wetlands vegetation.

Because of the integral relationship of wetlands with the natural floodplain, federal program descriptions and the assessment of impact identification and mitigation measures covers both wetlands and floodplains. A more detailed review, however, has been completed for program effects and impact mitigation measures related to floodplain resources.

D. History of Federal Government Efforts to Protect the Floodplain

The need for federal government leadership for flood control protection in the nation was recognized with the passage of the Flood Control Act of 1936. The 1936 Act established a national flood control policy that was designed: (1) to minimize loss of life and property damage, and (2) to achieve optimum economical use of the nation's floodplains. Since 1936, the federal government has invested about $9 million in flood protection projects. However, national losses due to flood damage have been increasing steadily to the present level of an estimated $1 billion annually.[1]

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[1] Comptroller General of the United States, National Attempts to Reduce Losses from Floods by Planning for and Controlling the Use of Flood-prone Areas, Report to the Congress (March 7, 1975).

National flood control projects supported by the federal government have been designed to protect already existing development in floodplain areas. Nevertheless, in some cases, these projects have secondary effects by making it possible for further development in floodplain areas to take place. Other federal programs, including facilities planning and construction projects such as sewer lines and highways funded by federal agencies, also allow urban development in floodplain areas to take place in some instances.

In 1966, President Johnson expressed concern about the federal role in flood protection and floodplain development. The President issued Executive Order 11296 (August, 1966) entitled, "Evaluation of Flood Hazards in Locating Federally-Owned or Financed Buildings, Roads and Other Facilities and in Disposing of Federal Lands and Properties." Two excerpts from the Executive Order state that:

> The heads of executive agencies shall provide leadership in encouraging a broad and unified effort to prevent uneconomic uses and development of the nation's floodplains, and in particular to lessen the risk of flood losses in connection with federal lands and installations and federally financed or supported improvements; and
>
> All executive agencies responsible for programs which entail land use planning shall take flood hazards into account when evaluating plans and shall encourage land uses appropriate to the degree of the hazard involved.

In response to the 1966 Executive Order, each federal agency has developed its own process for evaluating flood hazards associated with projects funded by federal funds. The evaluation process of an executive federal agency can be in the form of specific program regulations, guidance in a program planning manual, or procedures for reviewing project applications.

In 1968, Congress passed the National Flood Insurance Act as another measure for flood protection. The Act establishes the National Flood Insurance Program which makes available subsidized flood insurance for communities which adopt regulations meeting standards set up by the Federal Insurance Administration. A description of the National Flood Insurance Program is included in Chapter Three of this report.

Federal concern for the development of floodplain areas was also expressed in the National Environmental Policy Act (NEPA) of 1969. NEPA was enacted to insure that federal officials weigh environmental considerations along with social and economic considerations in policy formulation, decision-making and administrative actions. Under NEPA, federal agencies are required to prepare an Environmental Impact Statement which assesses the impacts of actions which have a significant effect on the environment. Floodplain areas may be considered in the environmental impact review of a proposed federal action.

In May, 1977, President Carter issued Executive Order 11988 entitled "Floodplain Management" which sets forth a new policy on the federal role in floodplain management. The new Executive Order revokes and replaces Executive Order 11296. Under Executive Order 11988, agencies are mandated to "avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid the direct and indirect support of floodplain development, whenever there is a practicable alternative."

The new Executive Order cites specific requirements for compliance by federal agencies:

- An agency must first determine whether the proposed federal action will occur in the floodplain;

- If the action is to occur in the floodplain, the agency shall study alternatives to avoid adverse effects in the floodplain; and

- If no practicable alternative is found, the agency must take steps to minimize the potential harm to lives and property as well as to protect the natural values of the floodplain.

Federal agencies are required to issue or amend existing regulations in order to define the means that the agency will use to encourage a nonhazardous use of floodplains. Federal agencies must promulgate appropriate floodplain management regulations and procedures by May 24, 1978. The U.S. Water Resources Council has been charged with the responsibility of coordinating federal agency approaches to the Executive Order.

Federal policy on floodplain areas has moved beyond flood hazard control. The increasing development of floodplain areas continues to destroy natural resources and create greater threats to human life and property. The federal government has now recognized that its financial assistance program can stimulate the unwise and risky development of the floodplains. Federal policy now directs federal agencies not only to reduce the potential of flood-losses but also to preserve and enhance the natural values of the floodplain. Although this study was formulated prior to President Carter's Executive Order, it is directed toward similar concerns about floodplain development, environmental impacts, and the need for effective management of federal agency programs.

CHAPTER TWO

FEDERAL PROGRAMS WHICH CAN PROTECT OR ALTER THE FLOODPLAIN

A. Introduction

This chapter reviews selected federal programs which can protect or alter the natural floodplain. Programs which can protect the floodplain were reviewed because they potentially can be used by the U.S. Environmental Protection Agency to reduce the impact of wastewater treatment facilities on floodplains. Programs which potentially can alter the floodplain were reviewed in order to identify methods for mitigating floodplain development impacts. It is possible that methods used by other federal construction programs may be useful in the '201' Wastewater Treatment Works Program of EPA.

Programs selected for review which protect the natural floodplain include the following:

- National Flood Insurance Program - Federal Insurance Administration, U.S. Department of Housing and Urban Development;
- National Environmental Policy Act Requirements - Council on Environmental Quality;
- Coastal Zone Management Program - Office of Coastal Zone Management, U.S. Department of Commerce;
- '404' Permit Program - U.S. Army Corps of Engineers;
- National Pollutant Discharge Elimination System Permit Program - U.S. Environmental Protection Agency;
- Urban Studies Program - U.S. Army Corps of Engineers;
- '701' Comprehensive Planning Assistance Program - Office of Community Planning and Development, U.S. Department of Housing and Urban Development; and

- '208' Areawide Water Quality Management Program-U.S. Environmental Protection Agency.

Each of these programs regulates development or encourages state or local government agencies to undertake environmental planning and regulations.

Programs selected for review which can alter the natural floodplain include the following:

- Federal-Aid Highway Program - Federal Highway Administration, U.S. Department of Transportation;
- Urban Mass Transportation Program - Urban Mass Transportation Administration, U.S. Department of Transportation;
- Public Works Facility Program - Economic Development Administration, U.S. Department of Commerce;
- Coastal Energy Impact Program - Office of Coastal Zone Management, U.S. Department of Commerce;
- Community Development Block Grant Program - Office of Community Development and Planning, U.S. Department of Housing and Urban Development;
- Sewer and Water Facility Loan and Grant Program - Farmers Home Administration, U.S. Department of Agriculture;
- '201' Wastewater Treatment Works Program - U.S. Environmental Protection Agency;
- Engineering Works for Drainage, Flood Control, and Hydroelectric Power (including programs of the Tennessee Valley Authority, U.S. Army Corps of Engineers, the Soil Conservation Service of the U.S. Department of Agriculture, Bureau of Reclamation of the U.S. Department of the Interior, and the Federal Energy Regulatory Commission);

- Federal Housing Assistance Program (including the Low Income Public Housing Program, of the U.S. Department of Housing and Urban Development, and mortgage insurance from the Federal Housing Administration); and

- Programs of the Appalachian Regional Commission.

Each of these programs potentially can directly alter natural areas in floodplains through project construction. In addition, each of these programs can influence the development of floodplain areas.

In the sections which follow, each program listed above is briefly described. Legislation authorizing the program and basic program requirements are indicated. Special provisions of each program which pertain to floodplain areas are noted, when present. Finally, in the last paragraph of each section, the relationship of the federal program to development in floodplain areas is indicated.

Program information was obtained through interviews with federal agency representatives, primarily located in Washington, D.C. The assistance of many federal agencies, as noted in this report, was essential to the preparation of the report. In addition, program guidelines and regulations were reviewed for information concerning the programs.

The statements in this report concerning the relationship of federal programs to floodplain development are based upon a review of existing literature on the subject of floodplain development and an analysis of program management and experience. These statements concerning floodplain impacts were reviewed and discussed with federal agency representatives, and, in most cases, were supported by the federal representatives.

The relationship of federal programs to floodplain development is difficult to state in general terms since federal program impacts vary from case to case. Also, as reviewed in detail in Chapter Four of this report, federal programs utilize several different types of floodplain impact mitigation measures to reduce the impacts of federal projects in floodplain areas. The statements concerning the impacts of federal projects on development in floodplain areas are, however, useful as background information for the case histories of floodplain development and federal actions, to be completed in the second phase of this study.

Programs which can protect the natural floodplain and programs which can alter the floodplain are described in the sections which follow.

B. Programs Which Protect the Natural Floodplain

Programs that help to protect floodplain areas either require that consideration be given to the natural values of the floodplain through planning or regulate development in the floodplain for environmental protection purposes. Federal programs which protect the natural floodplain include the National Flood Insurance Program, the Coastal Zone Management Program, the '404' Permit Program, the National Pollutant Discharge Elimination System Permit Program, the Urban Studies Program, the '701' Comprehensive Planning Assistance Program and the '208' Areawide Water Quality Management Program. In addition, procedures adopted by federal agencies in accordance with requirements of the National Environmental Policy Act help to protect floodplains from environmentally-damaging development.

Each of these programs is described below. Legal authority, the purpose of the program, and basic program provisions are indicated. The potential relationship of each program to development of floodplain areas is identified at the end of each section.

1. National Flood Insurance Program[1]

The National Flood Insurance Program, authorized by the National Flood Insurance Act of 1968 (P.L. 90-488), enables property owners in floodplain areas to purchase flood insurance. The program was enacted to reduce the loss of lives and properties during flood disasters and to reduce the spiraling federal cost of disaster relief. The Federal

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[1] This section was prepared with assistance from Mr. Timothy Maywalt, Floodplain Management Division, Federal Insurance Administration, U.S. Department of Housing and Urban Development, (November 7, 1977).

Insurance Administration (FIA) of the U.S. Department of Housing and Urban Development is responsible for administering the program.

Under the 1968 Act, the program was voluntary, both as to community participation and as to individual purchase of insurance. Thus, very few communities in the country participated in the program. In 1972, the extensive flood damage brought about by Hurricane Agnes made Congress aware that communities needed some incentive to join the National Flood Insurance Program (NFIP). The Flood Disaster Protection Act of 1973 was passed to increase the participation of local governments in the flood insurance program. The 1973 Act stated that no federal or federally-related financial assistance can be provided for the acquisition or construction of property in an "identified" flood-prone area unless the local government in which the property is located has entered the National Flood Insurance Program and the applicant for such financial assistance has purchased a flood insurance policy for the property. An "identified" flood-prone area is one for which the Federal Insurance Administration has published a map called a flood hazard boundary map. This map delineates the areas that have a probability of one percent of being flooded in any given year.

Flood insurance, under the federal program, is only sold to eligible local governments which are designated by the Flood Insurance Administration.[2] In order to become eligible for participation in the program, a local government must enact certain floodplain management measures. As a minimum, a government unit must require building permits for all proposed construction in the flood-prone areas and establish a permit review process to assure that structures are designed and located so as to reduce possible flood hazards.

Within the floodplain areas, proper anchoring of structures, the use of proper construction materials and methods which will minimize flood damage, adequate drainage of subdivisions, and the provision that new or replacement utility systems be located and designed to eliminate flood loss are also required of local governments. After these floodplain management measures have been adopted by the local government and approved by the Federal Insurance Administration, the jurisdiction can then participate in the National Flood Insurance Program.

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[2] 24 Code of Federal Regulations, Part 1909.

The flood insurance program is divided into two components, the emergency program and the regular program. Each is discussed below.

Emergency Program: The 1968 Act requires that a risk study be undertaken for each local government that became eligible for flood insurance. Since this requirement delayed the sale of insurance to local governments, the emergency program was established to allow for the early sale of flood insurance in the area. Under the emergency program, flood insurance policies provide general coverage regardless of risk to properties in the area.

Regular Program: After the risk study has been completed by the FIA, the local government can then participate in the regular flood insurance program. Under the regular program, additional insurance coverage is made available to property owners. However, the premium rates are based upon the actual risk of coverage as established by the completed risk study. When the community enters the regular program, it must require that all new construction or substantial improvements in the 'identified' flood-prone area be evaluated or floodproofed to the level of the base flood.

It is difficult to determine the environmental effect of the National Flood Insurance Program on floodplains. Due to the variety of forces affecting floodplain development, the actual effect varies among communities. On one hand, the Program mandates floodplain regulation by local agencies and helps to protect property from flood damage. In some cases, floodplain regulations developed in response to the Program discourage floodplain development. In other cases, such as coastal floodplain areas, the availablility of low-cost flood insurance can make floodplain development economically feasible. The difficult question to assess, however, is whether the floodplain development would have taken place whether or not the National Flood Insurance Program was in effect. According to officials in the Department of Housing and Urban Development, the Program primarily serves to protect floodplain development from flood damage.

2. National Environmental Policy Act Requirements[3]

The National Environmental Policy Act of 1969 (NEPA) requires that an Environmental Impact Statement (EIS) be developed for a major federal action which significantly affects the quality of the human environment. The objective of the Act is to improve the decision-making process of federal agencies so that environmental considerations are fully considered for a proposed project as well as economic and technological feasibility.

Regulations promulgated by the Council on Environmental Quality establish the general framework for the environmental impact statement process.[4] Federal agencies have developed individual agency regulations that are tailored to fit their own activities in response to these regulations.

An Environmental Impact Statement is a detailed description and analysis of the environmental aspects of a proposed federal action. An Environmental Impact Statement must be developed by federal agencies for actions which will have a major impact on the environment, regardless of whether a federal grant to a state or local agency is involved. The elements of an EIS are specified by the Council on Environmental Quality and are usually incorporated by federal agencies into individual program regulations and guidelines. As stated in the regulations of the U.S. Environmental Protection Agency (40 CFR 6.304), the following elements must be included in an EIS:

- Background and description of the proposed action;
- Alternatives to the proposed action;
- Environmental impacts of the proposed action;
- Adverse impacts which cannot be avoided should the proposal be implemented and steps to minimize harm to the environment;

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[3] This section was prepared with assistance from Ms. Susan Watkins, Office of Federal Activities, U.S. Environmental Protection Agency, (November 1977).

[4] 40 Code of Federal Regulations, Parts 1500-1508.

- Relationship between local short term uses of man's environment and the maintenance and enhancement of long-term productivity;

- Irreversible and irretrievable commitments of resources to the proposed action should it be implemented; and

- Problems and objections raised by other Federal, State and local agencies and by interested persons in the review process.

The proposed federal action must be analyzed to determine whether or not it conflicts with land use plans, policies, or controls for the affected area. If a conflict is present, attempts must be made to reconcile the proposed action with the existing plan, policy or control measure. In the assessment, impacts must be analyzed not only for direct consequences but also for indirect consequences.

An evaluation must be made of the possible impact of the project on future population and growth.

The Council on Environmental Quality regulations mandate that a draft Environmental Impact Statement be prepared as early as possible in the project planning process. The draft Environmental Impact Statement is then submitted for comment to federal, state, and local agencies as well as to the general public. The comments that are received by the sponsoring agency are used to modify the projected plans and to prepare a final statement.

Implementation of the National Environmental Policy Act has led to the identification of potential impacts of federally funded or sponsored projects in floodplain and wetland areas. In a number of cases, the identification of adverse environmental effects has led to project revisions or other actions which help to protect floodplains and wetlands.

3. Coastal Zone Management Program[5]

The Coastal Zone Management Program encourages states to exercise their full management authority over the lands and waters in coastal zone so that all natural and economic resources of the coastal zone are used efficiently. Under the authority of the Coastal Zone Management Act of 1972 (P.L. 92-583), grants are made to coastal states for the development and implementation of comprehensive coastal land and water management programs. The Program is administered by the Office of Coastal Zone Management of the National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

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[5] This section was prepared with assistance from Mr. Richard Gardner, Director of Policy and Program Development, Office of Coastal Zone Management U.S. Department of Commerce, (November 9, 1977).

The "coastal zone", as defined in the Act, includes coastal waters and adjacent shorelands where uses have a direct and significant impact on coastal waters. Coastal waters include waters with a measurable quantity of salt water (seaward to the three-mile limit), as well as the Great Lakes. The boundaries of the coastal zone, to be subject to the coastal zone management program developed by each state, vary among states. Sometimes boundaries extend inland to include entire counties, while in other cases immediately adjacent uplands comprise the coastal zone.

Coastal zone management programs must include policies and program elements related to permissible land and water uses, areas of particular concern, priority uses and areas for preservation and restoration, among others. Each state program must control permissible land and water uses through a regulatory program. The participation of the state in land and water use regulation is required.

Proposed state coastal zone management programs must be approved by the Secretary of Commerce before funds for the implementation of programs are made available. Program implementation measures usually emphasize regulatory programs, policies, criteria and standards for review of coastal programs, and administrative methods for inter-agency coordination.

The Coastal Zone Management Act prohibits state coastal zone programs from affecting any requirement established by the Federal Water Pollution Control Act or established by federal, state and local agencies pursuant to the Federal Water Pollution Control Act.

In general, federal activities or licenses within or affecting the coastal zone must be in conformance with the state's approved coastal zone management program. Through a review by the Secretary of Commerce, federal activities affecting coastal zones can be vetoed. This provision is called "federal consistency" and is an incentive to states to develop plans.

Since many coastal areas are also in floodplains, the coastal zone management program directly affects the planning and regulation of floodplain development. The Coastal Zone Management Program requires that states take into consideration flood hazard areas and valuable floodplains in developing state programs.

Each state's coastal zone management program is required to review coastal zone resources and consider whether certain types of areas require special management. These areas may include the following:[6]

1. Areas needed to protect, maintain or replenish coastal lands or resources including coastal floodplains, aquifer recharge areas, sand dunes, coral and other reefs, beaches, offshore sand deposits and mangrove stands; and

2. Areas of significant hazard if developed, due to storms, slides, floods, erosion, settlement, etc.

In addition, the national interest in the coastal zone must be considered by each state in planning for and siting energy facilities. Both wetlands and floodplains are specifically listed in the Coastal Zone Management Program regulations as resources in which there may be a national interest. Policy statements and executive orders (including the executive orders on wetlands and floodplains) must be evaluated. Typically, coastal zone management programs address wetland management concerns to a greater extent than floodplain management concerns.

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[6] Draft Regulations, 42 Federal Register 167, Section 923.21, Department of Commerce, National Oceanic and Atmospheric Administration, "Coastal Zone Management Program Approval Regulations", (August 29, 1977).

4. '404' Permit Program

Section 404 of the Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500) authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill material into navigable waters at specified disposal sites. The selection of disposal sites must be in accordance with guidelines developed by the Environmental Protection Agency. The Environmental Protection Agency can prohibit or restrict the use of any defined area as a disposal site whenever it is determined that the discharge will have an unacceptable adverse effect on municipal water supplies, shellfish beds, fishery areas, wildlife, or recreational areas.[7]

The term "pollutant" in the 1972 Act is defined to include many substances placed into the water, including dredged spoil, rock, sand, and dirt. Under the general provisions of the Act, NPDES permits are required before any of these materials can be discharged. Dredged and fill materials, however, are very different from liquid effluent. Filling, for example, destroys wetlands and fish and wildlife resources, in addition to polluting the water.

Permits are required for activities which result in discharges into navigable waters and contiguous and adjacent wetlands, as defined in the regulations. In effect, a permit is required for any dredge or fill activity, or the placement of any structure in fresh or saltwater wetlands and waters. The Permit Program is administered by the District Offices of the U.S. Army Corps of Engineers.

As defined in the program regulations, '404' permit jurisdiction includes waters and wetlands as follows:

1. Territorial seas;
2. Coastal and inland waters, lakes, rivers, and streams that are navigable waters of the United States, including adjacent wetlands;

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[7] 42 Federal Register 138, U.S. Army Corps of Engineers, "Regulatory Program of the Corps of Engineers", (July 19, 1977).

3. Tributaries in navigable waters of the United States, including adjacent wetlands (manmade non-tidal drainage and irrigation ditches excavated on dry land are not considered as waters of the United States);

4. Interstate waters and their tributaries, including adjacent wetlands; and

5. All other waters of the United States, such as isolated wetlands and lakes, intermittent streams, and others where the degradation or destruction of the waters could affect interstate commerce.

The landward limit of jurisdiction in tidal waters, in the absence of adjacent wetlands, is the high tide line. In other waters, in the absence of adjacent wetlands, the ordinary high water mark is the landward limit of jurisdiction. Additional technical definitions are provided in the regulations.

The definition of "wetlands" is especially important for fish and wildlife protection. The term "wetlands" is defined to mean those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes and bogs.

The term "adjacent" means bordering, contiguous, or neighboring. Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, and beach dunes are considered "adjacent wetlands" for permit purposes.

The entire length of rivers and streams are included in the definition of waters of the United States. Individual or general permits are required below the headwaters. Discharges above headwaters are authorized through a nationwide permit included in the July 19, 1977 regulations. The term "headwaters" is defined to mean the point on a freshwater (non-tidal) stream above which the average annual flow is less than five cubic feet per second.

Although discharges of dredged and fill material are legally considered to be point sources, because they often span a geographical area of substantial size and affect runoff from the land, they have many characteristics of non-point sources. Runoff is influenced by dredge and fill activities in two ways. First, wetlands which might otherwise absorb pollutants from upland, inland areas are destroyed. Secondly, the dredged or fill material itself may have toxic substances or other pollutants which will be carried to the water as sediment.

The Corps of Engineers is extremely responsive to local interests, including state, regional, and local public agencies. If local interests recommend that a permit should not be issued due to water quality concerns, it is likely that the Corps will respect and follow that recommendation.

The '404' permit program directly regulates land use activities in wetlands in order to protect natural resource values. The jurisdiction of the '404' Program does not include the entire floodplain.

5. National Pollutant Discharge Elimination System Permit Program

Section 401 of the Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500) requires that an applicant for a federal license or permit to discharge into the navigable waters must provide certification from the state that any such discharge will comply with applicable provisions of the federal law. Section 402 of the 1972 Act provides the authority for a permit system called the National Pollutant Discharge Elimination System (NPDES). The Program regulates the types of discharges but does not directly review and approve the location of land uses or activities resulting in the discharge.

The NPDES discharge permit binds the discharger to a specified set of requirements concerning the frequency, quantity and location of pollutant discharges. Other permit conditions, such as abatement schedules and monitoring and reporting requirements, are also included in the permit. In effect, the NPDES permit specifies the rules under which the discharger is allowed to continue discharging into the water-ways.

Under provisions of the Federal Water Pollution Control Act Amendments, a state may be granted authority to implement the permit system within its borders, subject to oversight by EPA.

State permitting agencies must provide that permits will not be issued for the discharge of any radiological, chemical, or biological warfare agent or high-level radioactive waste into navigable waters; any discharge that the Corps of Engineers finds would impair navigation; or any discharge to which the Regional Administrator of the U.S. Environmental Protection Agency objects in writing.

The NPDES Permit Program directly regulates discharges from industries and public waste treatment facilities which are located in the floodplain. Unless an NPDES permit is obtained, the discharger is not allowed to operate. Although NPDES Permit Program is directed toward the protection and enhancement of water quality, it serves a secondary purpose of protecting natural values in certain floodplains. When river waters overflow their banks and spread over the floodplain, they carry with them pollutants which are suspended in the water. Certain pollutants, such as toxic materials, can harm fish and wildlife which inhabit the floodplain. This is especially a concern in wetland areas which play an important role in the life support systems of many birds, animals and other wildlife.

6. Urban Studies Program[8]

The Urban Studies Program of the U.S. Army Corps of Engineers provides technical planning assistance to state and local governments to develop plans and programs for water resource management. The Program was authorized by a Senate Resolution which was adopted in March, 1972.

Urban Studies are undertaken at the request of state and local government and are funded on an individual basis by Congress. Each Urban Study is programmed to be completed within a three year period.

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[8] This section was prepared with assistance from Col. Ted E. Bishop, Assistant Chief of the Planning Division, U.S. Army Corps of Engineers, (November 9, 1977).

All costs except for 25 percent of the wastewater management aspects of the Study are funded by the federal government. The local share for the wastewater management element of the Study is usually provided in the form of technical assistance by the local government involved, rather than through a cash contribution. Wastewater management studies must be compatible with plans being prepared and implemented in response to the Federal Water Pollution Control Act Amendments (P.L. 92-500).

Urban Studies address different water resource problems, depending upon the problems in the urban area. Urban Studies may have the following objectives:

- Urban flood control;
- Floodplain management;
- Wastewater management;
- Water supply;
- Regional harbor and waterways needs;
- Bank and channel stabilization;
- Recreation; and
- Lake, ocean and estuarine protection.

Each Urban Study is conducted by the Corps of Engineers District or Division Office which has responsibility for the area in which the Study is authorized. Each Urban Study identifies alternative urban water resource plans to meet long range needs (about 50 years). Each study also identifies a phased early action program for each alternative urban water resource plan to meet short range needs (about 20 years). If appropriate, a proposal for Congressional authorization of selected projects will be prepared.[9]

The urban water resource planning that is conducted by the Corps must not duplicate other federal, federally-assisted, state, or regional programs. In keeping with this policy, on November 22, 1974, the Secretary of the Army and the Administrator of the Environmental Protection Agency (EPA) signed an inter-agency agreement that stated that the EPA's '208' Areawide Water Quality Management Program and the elements of the Urban Studies Program dealing with wastewater management would be coordinated. In cases where an Urban Study may have been conducted previous to the initiation of the '208' planning process in a given area, the '208' plan will use the completed Urban Study as a base and develop more detailed analysis. If the '208' planning process and the Urban Study for a given area are conducted simultaneously, the work will be divided among the respective programs in order to avoid duplication of work components.

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[9] U.S. Army Corps of Engineers, The U.S. Army Corps of Engineers Urban Studies Program, Program Description, (April 1, 1977).

The Urban Studies Program is a planning assistance program designed to address water resource management problems. Urban Studies often address problems directly related to floodplain management and development, and identify solutions compatible with the national resource values of floodplains. It is the responsibility of state and local governments to enact laws and regulations based upon recommendations of the Urban Study.[10]

7. '701' Comprehensive Planning Assistance Program[11]

The '701' Comprehensive Planning Assistance Program, administered by the Office of Community Planning and Development of Housing and Urban Development (HUD), makes grants available for comprehensive planning to state, regional and local governments. The '701' Program, authorized by the Housing Act of 1954 (P.L. 83-560), was enacted to strengthen the planning and decision-making capabilities of state and local governments.

The recipient of a '701' planning assistance grant must prepare a comprehensive plan which includes at least a land use element and a housing element. On a two year cycle, each grantee must review and update its comprehensive plan and evaluate how it is meeting the objectives set forth in the comprehensive plan. The land use element of the '701' plan must include criteria and procedures needed to guide major growth decisions. The '701' housing element must take into account all available information concerning housing needs and must identify approaches for meeting those needs.

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[10] The U.S. Army Corps of Engineers has a specific program to assist state and local governments in managing their floodplain areas. Under the Floodplain Management Technical Services Program, the Corps will undertake floodplain information studies for specific locations and will provide guidance for the formulation of local floodplain management plans and regulations.

[11] This section was prepared with assistance from Mr. Eugene Hix, Office of Community Planning and Development, U.S. Department of Housing and Urban Development.

Before the advent of the '208' Areawide Water Quality Management Program administered by the Environmental Protection Agency (EPA), '701' grants were used for water quality related planning studies. HUD and EPA have now entered into an interagency agreement which provides for coordination between the '701' land use element and '208' planning. The '701' land use element is to provide basic land use data and policies for the location of urban development. The land use evaluation of the '208' Areawide Water Quality Management Plan should determine the most effective design of treatment facilities consistent with the land use plans.

Environmental planning must be included in the '701' comprehensive planning process. The comprehensive plan must:[12]

- Identify salient elements of the natural and man-made environments, their interrelationships, and major problems and opportunities they present for community development;
- Assess those environmental factors which will:
  - (1) minimize damage, unwise use of natural resources;
  - (2) recognize major latent environmental dangers or risks (e.g. floods, mud slides, earthquakes, air and water pollution); and
  - (3) enhance the benefits from the use of the natural environment (e.g., use of natural drainage systems for parks and recreation areas);
- Incorporate state environmental policies and standards; and
- Incorporate HUD environmental policies and standards for floodplain management (24 CFR part 1910).

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[12] 41 Federal Register 164, (August 22, 1975) and 42 Federal Register 21, (February 1, 1977).

Under these requirements, the comprehensive plan may address such issues as how growth will be controlled in critical natural areas such as wetlands and floodplains. Flood-prone areas, mud slide-prone areas, and flood-related erosion areas must be considered during the planning process.

The '701' Comprehensive Planning Assistance Program gives local and state governments the opportunity to develop plans related to urban development in floodplain areas which protect natural floodplain values. The Program does not require, however, that detailed floodplain planning be completed.

8. '208' Areawide Water Quality Management Program[13]

Section 208 of the Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500) authorizes the '208' Areawide Water Quality Management Program. Under provisions of the Program, planning grants are available to designated areawide '208' planning agencies as well as to state agencies. States are responsible for preparing an overall state plan which incorporates the individual plans prepared by the designated areawide agencies. Areawide agencies are designated by the governor and approved by regional offices of the Environmental Protection Agency.

An areawide water quality management plan is a document which identifies the water quality problems of the planning area and sets forth an effective management program to alleviate problems and preserve water quality. The development of plans involves the establishment of attainable water quality goals, the identification of necessary controls and regulatory programs, and the determination of the resulting environmental, social and economic impacts.

The identification of municipal waste treatment facilities needs is a required element of state and areawide water quality management plans. Municipal system needs for each five-year period, extending at least over a 20 year period, must be identified in the plan. An analysis of alternative waste treatment systems, requirements for facilities, and the general availability of land for facilities, must also be indicated in the plans.

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[13] This section was prepared with assistance from Mr. James Meek and Mr. Carl Myers, Program Development Branch, Water Planning Division, U.S. Environmental Protection Agency, (November 8, 1977).

In addition, control measures related to non-point sources of pollution, such as urban runoff and erosion, must be specified in the plan.

Approved '201' facilities plans must be considered as detailed portions of water quality management plans. The state or areawide planning agency is responsible for assuring that '201' facilities plans are compatible with the state or areawide water quality management plan.[14] As described in a program guidance memorandum, water quality management plans should utilize and incorporate (not duplicate) 201-funded planning information.[15]

Water quality management plans must identify waste treatment management agencies with sufficient legal and management capability to carry out certain programs included in the areawide plan. Only designated waste treatment management agencies are eligible for '201' facilities planning and construction grants.

Funding for a two-year intensive planning effort is provided to designated areawide agencies and to states to complete water quality management plans. A continuing planning process must be included in the plan. The continuing planning process assures that the necessary institutional arrangements and management programs are established to make and implement coordinated decisions.

'208' areawide water quality management plans address a wide range of causes and control measures related to point and non-point sources of water pollution. The geographic area covered by water quality management plans includes both areas in and outside of the floodplain. A summary of existing and projected land use patterns as well as an identification of sources of pollution (including pollution from floodplain development, if present) must be included in the plan.

It is possible for '208' water quality management plans to address in detail the question of water quality control measures related to urban development in the floodplain. By protecting water quality, many natural values of the floodplain can also be protected. The precise way or degree to which urban floodplain development is addressed, however, varies among '208' plans. Generally, the plans that have been submitted to EPA for approval have not examined impacts related to urban development in the floodplain to a significant extent.

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[14] 40 Federal Register 230, Part 131, (November 28, 1975).

[15] Environmental Protection Agency, Program Requirements Memorandum PRM No. 75-38, (February 9, 1976).

C. Programs Which Alter the Natural Floodplain

Alteration of the natural floodplain is primarily due to construction activities adjacent to or in the floodplain. Various federal programs fund the construction of community facilities and other projects in the floodplain. These programs include the Federal-Aid Highway Program, the Urban Mass Transportation Program, the Public Works Facility Program, the Coastal Energy Impact Program, the Community Development Block Grant Program, the Sewer and Water Facility Loans and Grant Program, the '201' Wastewater Treatment Works Program, Engineering Works for Drainage, Flood Control, and Hydroelectric Power, Federal Housing Assistance Programs, and programs of the Appalachian Regional Commission. These programs are briefly described in the sections which follow.

1. Federal-Aid Highway Program[16]

The Federal-Aid Highway Program, under the authorization of Title 23 of the United States Code, provides financial assistance to states for the planning, design, and construction of Federal-Aid Highway Systems. The Program, administered by the Federal Highway Administration (FHWA) provides funds to state transportation agencies for the development of Interstate highways as well as primary, secondary and urban roads.

Ninety percent of the cost of Interstate highway construction is funded by FHWA. Funding is made available to the states for up to seventy percent of the costs of primary, secondary, and urban roads. Funds may also be used for the construction of structures and facilities related to highways, such as bridges, bikeways, pedestrian walkways, rest areas and parking facilities.

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[16] This section was prepared with assistance from Mr. Frank Johnson, and Mr. Charles De Jardins, Federal Highway Administration, U.S. Department of Transportation, (November 8, 1977).

In order to be eligible for funding, states are required to give consideration in their planning to:

- Economic and social effects of the projects; and
- Environmental impacts of the projects.

State transportation agencies which receive federal funds are responsible for highway location planning and engineering studies.

It is the policy of the Federal Highway Administration that where practicable, highway locations should avoid areas subject to flooding. FHWA's regulations (23 CFR 650.103) state that: "It is the policy of the Federal Highway Administration to encourage a broad and unified effort to prevent uneconomic, hazardous or unnecessary use and development of the Nation's floodplains, and in particular to lessen the risk of flood in connection with federally-financed improvements... It is the policy of the Federal Highway Administration that, where practicable, highway locations shall avoid areas subject to flooding."

Although it is the policy of the Federal Highway Administration to avoid areas subject to flooding, highways are sometimes located in floodplain areas. Highway construction in floodplains (as well as outside of floodplains) can allow or encourage urban development.

2. Urban Mass Transportation Program[17]

The Urban Mass Transportation Program, administered by the Urban Mass Transportation Administration (UMTA) of the U.S. Department of Transportation, provides loans and grants available for mass transit facilities. Under the provisions of the Urban Mass Transportation Act of 1964 (P.L. 88-365), the

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[17] This section was prepared with assistance from Mr. Kiyoshi Mano, Environmental Specialist, Urban Mass Transportation Administration and Mr. Alexander McNeil, Region IV Office, Urban Mass Transportation Administration, U.S. Department of Transportation, (November 10, 1977).

Program provides funds to state and local governments for planning, construction, operation and maintenance of mass transit systems.

Three types of funds are available to state and local governments:

- Technical studies grants;
- Capital assistance loans and grants; and
- Operating grants.

Grants to conduct technical studies are awarded to cover up to 80 percent of the cost of planning, engineering and design of urban mass transit projects. These projects are included as elements in unified urban mass transportation plans.

The second type of funds, capital assistance grants and loans, are awarded for the acquisition and improvement of capital equipment and facilities needed for both public and private mass transportation systems.

The third type of UMTA funding... operating grants... is available only to urbanized areas of over 50,000 persons. The operating assistance grants are awarded for use either for operating purposes or capital acquisition purposes. When applying for any of these three types of funding, grantees must assess the impacts of the mass transportation system being developed upon the social, economic and natural environment.

The development of mass transportation facilities increases accessibility and may increase the feasibility of urban development. The location of either bus lines or rapid rail lines tends to centralize urban growth along the transportation lines. It is the policy of UMTA to avoid floodplain areas. Where no practicable alternative is available, however, mass transportation projects funded through the Urban Mass Transportation Program are sometimes located in floodplains.

3. Public Works Facility Program[18]

The Public Works Facility Program provides funds for community facilities in order to stimulate economic development and provide local employment. Grants from the Economic Development Administration (EDA) of the U.S. Department of Commerce are available for the acquisition and construction of public works facilities in economically disadvantaged areas. Grants are made available to state and local governments for up to 100 percent of the project construction costs.

The EDA Public Works Program is authorized by the Public Works and Economic Development Act of 1965 (P.L. 89-136). Through the Program, funds are available for projects which have long-term economic benefits.

Projects eligible for funding under this Program include, but are not limited to, the construction and expansion of municipal offices, courthouses, libraries, schools, water and sewer lines, waste treatment facilities and solid waste disposal facilities.

The Public Works Facility Program often funds the construction of urban facilities in order to encourage additional employment. Thus, the facilities funded by EDA may have the indirect effect of allowing or encouraging urban development in the floodplain. Public works facilities located in the floodplain can impede the ability of the floodplain to absorb flood waters, filter pollutants and serve as a wildlife habitat.

4. Coastal Energy Impact Program[19]

Under the provisions of Section 308 of the Coastal Zone Management Act (P.L. 92-583), financial assistance is provided through grants, loans and bond guarantees to state and local governments affected by new or expanded energy activities in the coastal zone. Coastal energy activities include the exploration and development of offshore natural resources as well as the construction and expansion of energy-related facilities onshore. The Office of Coastal Zone Management of the National Oceanic and Atmospheric Administration, U.S. Department of Commerce, is responsible for administering the Coastal Energy Impact Program.

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[18] This section was prepared with assistance from Mr. John Hansel, Special Assistant for the Environment, Economic Development Administration, U.S. Department of Commerce, (November 9, 1977).

[19] This section was prepared with assistance from Ms. Lisa Jorgenson, Environmental Specialist, Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, (November 9, 1977).

Federal program funds are available for three purposes. First, the Program makes available planning grants to prepare for the oncoming energy activity and related socio-economic and environmental consequences. Second, loan and grant funds are available to help finance new or improved public facilities and public services related to the energy activity. Finally, the Coastal Energy Impact Program provides grants to prevent or repair damage to environmental or recreational resources which are the result of energy activities when the person responsible cannot be identified.

September 2, 1977, environmental guidelines of the Department of Commerce identify specific provisions related to waste treatment facilities projects. If a proposed coastal energy impact project is a waste treatment plant, specific information and approvals which closely follow requirements of the U.S. Environmental Protection Agency for the '201' Wastewater Treatment Works Program are required. Plans for proposed treatment plants must conform with the state continuing water quality management planning process, effluent limits of the state, and '208' areawide waste treatment management plans.

The Coastal Energy Impact Program is designed to help state and local governments manage developing coastal resources effectively. The Program helps insure that federal assistance does not become an incentive for inappropriate development.

Public facilities which can be funded through the Coastal Energy Impact Program include waste treatment facilities and other public works if they are necessitated by new or expanded energy activities. It is the intention of the Program to fund facilities only when needed to reduce impacts from development. If waste treatment facility funding is available through other federal programs such as EPA's '201' Wastewater Treatment Works Program, it is unlikely that the Coastal Energy Impact Program will also fund the facilities. Coastal Energy Impact Program funds, however, may be used as the local match for a '201' wastewater treatment works grant from the U.S. Environmental Protection Agency.

Many coastal cities and counties which experience impacts from energy activities are located in floodplain areas. Through loans and grants for planning, operations, and regulatory activities, the Coastal Energy Impact Program can help local and state governments provide for floodplain development in such a way that adverse impacts, including environmental impacts, are reduced. The Program also makes grants available for the repair of damages to resources harmed by the coastal energy activities. Many of the resources affected, such as marshes and sand dunes, are located in the floodplain.

5. Community Development Block Grant Program[20]

The Housing and Community Development Act of 1974 (P.L. 93-383) provides local governments with federal financial assistance for projects and activities to address housing and community development needs. The Community Development Block Grant Program, administered by the Office of Community Development and Planning, U.S. Department of Housing and Urban Development (HUD) is designed to assist state and local governments in the development of low and moderate income housing.

The Block Grant Program has replaced several separate federal community development programs, including sewer and water grants, urban renewal programs and the Model Cities Program of the U.S. Department of Housing and Urban Development. Activities and programs related to housing rehabilitation, flood drainage facilities, streets and street lights, solid waste disposal facilities and sewer and water lines may be funded through the Block Grant Program. Water quality management activities which are eligible for funding include:

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[20] This section was prepared with assistance from Mr. Peter Rowan, Community Development Block Grant Program, U.S. Department of Housing and Urban Development, (November 7, 1977).

- Construction of storm sewer facilities;
- Regulation of urban development through local permits; and
- Non-structural programs for urban runoff control, such as seeding and sodding along stream banks.

Community Development Block Grant funds may only be used to construct flood and drainage facilities when it has been determined that financial assistance is not available from other federal programs. The funds may be used by local governments to match federal monies from other available federal agency grant programs.

Community Development Block Grant funds may be used by a local government for the acquisition and construction of public facilities in the floodplain, if steps are taken to mitigate flood hazards. Facilities such as storm sewers which are funded through the Program can result in additional floodplain development.

6. Sewer and Water Facility Loan and Grant Program[21]

In accordance with the provisions of the Consolidated Farm and Rural Development Act (P.L. 92-419), the Farmers Home Administration (FmHA) of the U.S. Department of Agriculture makes loans and grants available to rural areas for the construction and improvement of public water and sewer systems, including treatment facilities and sewer and water lines.[22] Funds are only available to rural communities where the facility will serve areas having a population less than 10,000 people.

The Farmers Home Administration funds may be used for construction, legal and engineering services, land acquisition and other related expenses connected with the development of these community facilities. Grants are made available for up to 50 percent of project development costs. Close administrative coordination between the Farmers Home Administration and state water quality offices is maintained in order to ensure that limited federal funds are used most effectively.

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[21] This section was prepared with assistance from Mr. Glen E. Walden, Farmers Home Administration, U.S. Department of Agriculture, (November 10, 1977).

[22] The sewer and water facility loans are part of the Farmers Home Administration's overall financial assistance program to community facilities in rural areas.

Community facilities funded by the Farmers Home Administration are sometimes located in the floodplain and like other programs which fund sewer and water facilities, can result in floodplain development and related environmental impacts. Sewer and water facilities construction often makes more intensive urban development possible.

7. '201' Wastewater Treatment Works Program[23]

The '201' Wastewater Treatment Works Program authorized by Section 201 of the Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500) provides federal assistance for the planning, design and construction of publicly-owned waste treatment facilities. The '201' Program is administered by the U.S. Environmental Protection Agency.

The '201' Program is administered in a three-step process. Application for funding each step is made separately, and funds for each successive step are dependent upon the successful completion of the previous step. The steps are as follows:

Step 1: Facilities Planning:

> Plans and studies which demonstrate the need for the facility, evaluate feasible alternatives, and demonstrate that the proposed waste treatment facilities represent the most cost-effective means of meeting water quality goals, and recognize environmental and social conditions.

Step 2: Preparation of Design Plans and Specifications:

> Following the approval of the Step 1 Facilities Plan, detailed engineering studies related to facilities construction are prepared.

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[23] This section was prepared with assistance from Mr. Larry McBennett and Ms. Nancy Goodman, Facility Requirements Branch, U.S. Environmental Protection Agency, (November 9, 1977).

Step 3: Construction Grants:

> After facilities plans and engineering specifications have been completed, grants for the actual construction of waste treatment facilities are provided.

All '201' facilities grants are reviewed and approved by the appropriate Regional Office of the U.S. Environmental Protection Agency.

State agencies prepare a Priority List for '201' project funding which is reviewed and approved by EPA Regional Offices. In preparing the list, consideration is given to the severity of existing pollution problems, the population affected by the facility, the need for preservation of high quality waters, national priorities, and available funds.[24]

Municipal waste treatment facilities are constructed by local agencies in order to reduce health, sanitation, and water quality problems, and to meet the requirements of the Federal Water Pollution Control Act Amendments. In some cases, the construction of facilities increases the potential for urban development in the floodplain. Secondary development made possible by sewer and water facilities can, in turn, result in increased runoff, block the natural flow of floodwaters, and alter wildlife habitats.

8. Engineering Works for Drainage, Flood Control, and Hydroelectric Power

Several federal agency programs provide for the development of engineering works for drainage, flood control and hydroelectric power. These engineering works often include dams, reservoirs, dikes, levees, or channels.

Funding for the construction of structural floodway modification measures is primarily provided by the U.S. Army Corps of Engineers, the Soil Conservation Service of the U.S. Department of Agriculture, the Tennessee Valley Authority and the Bureau of Reclamation of the U.S. Department of Interior. A majority of these engineering works have been for flood control purposes. The reservoirs and dams funded by federal agency programs often provide additional benefits, including the improvement of navigation, electric power generation and recreation.

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[24] 39 Federal Register 5257, Section 35.915, U.S. Environmental Protection Agency, (February 11, 1974).

Under the provisions of the Flood Control Act of 1936 (P.L. 74-738), the U.S. Army Corps of Engineers constructs major dams, reservoirs, levees, dikes, and other waterway structures. These engineering works provide flood protection for urban areas and major river valleys, reduce the cost of transportation, generate hydroelectric power and provide recreational opportunities. These projects, by providing protection to downstream areas in major river valleys and floodplains, sometimes make the development of floodplains possible.

Under the Watershed Protection and Flood Prevention Program of the Soil Conservation Service (SCS), flood prevention and drainage projects are funded. Watershed projects funded by the Soil Conservation Service are limited to areas smaller than 250,000 acres. Such projects have multiple purposes, which may include rural water supply, irrigation, recreation, and fish and wildlife enhancement. The SCS has also undertaken drainage projects in lowlying wetlands which enhance the potential for agricultural production and flood protection for rural communities. It may be argued that, in some cases, the drainage of agricultural land enhances land values and also makes more intensive urban development possible.

Dams and reservoirs also have been built by the Tennessee Valley Authority (TVA). The Tennessee Valley Authority Act of 1933 (44 Stat. 58) established TVA as a corporate agency of the federal government to conduct a broad program for the economic development of the Tennessee River Valley region, which runs through Virginia, Tennessee, Alabama, Georgia, North Carolina, Kentucky and Mississippi. TVA has built an extensive dam system that regulates floods on the Tennessee River and its major tributaries. These projects have made urban development feasible in areas downstream from the reservoirs. The dam system also provides for electric power generation in the Tennessee River Valley region.

The Bureau of Reclamation of the U.S. Department of Interior provides assistance to state and local government in the development and implementation of reclamation projects for the arid and semi-arid lands of the Western United States. These projects are designed to stimulate local and regional economies, enhance and protect the natural environment, and assist in the development of land and water resources. Under the provisions of the Reclamation Act of 1902 (33 Stat. 588), the Bureau locates, constructs, operates and maintains engineering works for the storage, diversion and development of water resources for land reclamation purposes. Projects such as dams and reservoirs which alter the natural environment in arid and semi-arid areas can increase the potential for urban development in floodplains.

Many of the engineering works funded by the Corps of Engineers, the Soil Conservation Service, the Tennessee Valley Authority, and the Bureau of Reclamation have served to provide hydroelectric power in the affected areas. Engineering works which are to be operated by non-federal entities and which are primarily designed for hydroelectric power generation must be licensed by the Federal Energy Regulatory Commission.

Licenses for the construction and operation of non-federal hydroelectric project are issued by the Federal Energy Regulatory Commission (FERC),[25] which was previously known as the Federal Power Commission. The Federal Energy Regulatory Commission is also responsible for the regulation of the interstate aspects of electric power and gas industries.

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[25] The Federal Energy Regulatory Commission is a branch of the Department of Energy. The Department of Energy (previously known as the Federal Energy Administration) is charged with the responsibility of ensuring that the supply of energy available is adequate to meet the total energy demands of the country. The Department of Energy's responsibilities include the evaluation of energy allocation and pricing regulations, the development of energy conservation plans, the administration of a petroleum storage program and establishing industrial energy efficiency targets. The Department of Energy is not responsible for the regulation of energy facility siting.

Pursuant to the provisions of the Federal Power Act of 1920, (41 Stat. 1063) FERC is required to make its licensing decisions in such a way that comprehensive use of water resources is encouraged. Hydroelectric projects, in addition to their primary purpose of electric power generation, can benefit recreation, water sports and wildlife purposes.

A licensed hydroelectric project generally includes a dam, a power station, a reservoir, recreation facilities, and open space land surrounding the project. The amount of open space land held within the boundaries of the hydroelectric project depends on the costs of the land and the existing uses found near the hydroelectric project.

Engineering Works for Drainage, Flood Control, and Hydroelectric Power are almost always located in floodplain areas. Through the construction of physical barriers between the river and the floodplain (such as the construction of dams and channels), these projects can make it possible for development to occur in locations which would otherwise be subject to frequent flooding. In some cases, however, the engineering works provide protection for development which has already occurred.

An additional factor which may have some influence on floodplain development is the provision of energy at low cost through hydroelectric projects. The degree to which the availability of low cost energy influences residential, commercial, and industrial development varies among specific locations.

9. Federal Housing Assistance Programs

The U.S. Department of Housing and Urban Development (HUD) is responsible for administering the various federal programs for the construction, financing, and management of housing as well as for the rehabilitation of housing stock. Under the provisions of numerous Housing Acts, HUD awards grants and loans for urban development, low rent housing and college housing; insures mortgages and subsidizes housing construction and rentals; and disposes of residences on which mortgages have been foreclosed.

The Low Income Public Housing Program, authorized by the Housing Act of 1937 (P.L. 73-479) provides federal loans and grants to public housing agencies for the construction of low income housing, the rehabilitation of existing structures, and for supplementing rent payments of low income individuals. Loans and debt service grants are provided to colleges to finance construction rehabilitation, or acquisition of housing and related facilities.

Through the Federal Housing Administration (FHA), HUD provides insurance for mortgages to facilitate homeownership and the construction and financing of housing. By insuring private lenders against loss, the FHA provides assistance for the purchase of homes, the construction of rental housing, and rehabilitation of housing structures. The FHA also administers a mortgage insurance program for land development. This program covers the purchase of raw land, the installation of land improvements for new subdivisions, and the development of new communities.

All housing programs which receive financial assistance from HUD are required to purchase flood insurance. In response to the 1966 Executive Order 11296 "Evaluation of Flood Hazards", HUD has directed that flood hazards be evaluated in the loan, grant and mortgage insurance programs which involve new construction. HUD's policy is to take whatever action necessary to minimize the exposure of such construction to possible flood damage.[26]

When federal housing programs are undertaken in floodplain areas, they can affect the natural values of floodplains as buffers against floodwaters and erosion damage. Although housing construction can in turn lead to the construction of schools, shopping areas, and other urban developments, housing construction is not a major factor which makes open lands in floodplains available for urban development.

10. Programs of the Appalachian Regional Commission

The Appalachian Regional Commission is a federal-state governmental agency that is concerned with the economic, physical and social development of the 13-state Appalachian region.

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[26] Comptroller General of the United States, National Attempts to Reduce Losses From Floods by Planning for and Controlling the Uses of Flood-Prone Areas, Report to Congress, p. 13, (March 7, 1975).

The program of the Commission is directed by the Governors of the Appalachian states, a state co-chairman appointed by the Governors and a federal co-chairman appointed by the President. The Commission's program is financially supported equally by the federal government and the member states. Under the provisions of the Appalachian Regional Development Act of 1965 (P.L. 89-4), the Applachian Regional Commission provides technical planning and financial assistance for the economic growth of the Appalachian region.

Each state which participates in the Commission's development programs is required to file an Economic Development Plan annually. Local government projects which are proposed for Commission funding must be in conformance with state development plans.

Grants are provided for projects such as the construction of highways, education, health and child development centers, low and moderate income housing, land reclamation projects, and community facilities. Funds provided may also be used as the local match for projects which are funded by other federal agencies.

From the annual Congressional appropriation, Commission funds are allocated in two ways.[27] First, funds are allocated for projects in areas which show significant growth potential. Secondly, funds are allocated as supplementary grants to local governments in order to meet local share requirements for other federal grant assistance programs. Supplementary grants may be used for projects such as libraries, waste treatment facilities, industrial site development and water supply facilities.

When a project is approved for either direct grant assistance or supplemental grant assistance, the project is referred to as an appropriate federal agency for evaluation and administration. Since the programs which are assisted by the Appalachian Regional Commission are carried out by a federal agency, state and local governments receiving grants must meet the planning, design, construction and environmental requirements of that agency. The Commission does not have requirements for project planning, design, construction, and environmental considerations.[28]

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[27] Appalachian Regional Commission, "Appalachian: A Journal of the Appalachian Regional Commission," p. 38, (October-November, 1976).

Projects funded by the Appalachian Regional Commission can affect floodplains and floodplain development, although that is not their purpose. For example, a highway or treatment facility constructed as a result of financial assistance from the Commission can make increased urban development in floodplains possible. The increased development, in turn, can damage wetlands, wildlife habitats, and other natural values of floodplains.

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[28] Telephone interview with Mr. Orlando A. Riutort, Deputy Director, Division of Housing and Community Development, Appalachian Regional Commission, Washington, D.C., (November 16, 1977).

CHAPTER THREE

METHODS USED BY FEDERAL PROGRAMS TO REDUCE FLOODPLAIN DEVELOPMENT PRESSURES

A. Introduction

The planning, regulation, and construction programs reviewed in Chapter Two use specific legal and administrative methods for reducing or mitigating the secondary impacts of the programs in floodplain areas. Regulatory approaches, policies and impact assessment processes are used to reduce dangers of flood hazards as well as to protect the natural features of the floodplain.

This chapter describes and assesses the approaches used by federal agencies to reduce impacts from development in the floodplain. Other chapters of this report relate the mitigation methods used by federal programs to the '201' Wastewater Treatment Works Program of the U.S. Environmental Protection Agency.

The major types of approaches used by federal programs to reduce floodplain development pressures are:

- Direct regulation of land uses in the floodplain, either by federal, state, or local agencies;
- Policies pertaining to floodplain development, including design standards to avoid flood hazards, location criteria to avoid development in the floodplain, and natural resource protection policies which include the avoidance of environmental damage in the floodplain; and
- Environmental impact assessment procedures carried out during the planning process in compliance with the National Environmental Policy Act (NEPA).

The first two approaches, regulations and policies implemented through grant administration, directly control certain environmental impacts which may be created by the federal project and related secondary development. The third approach, environmental impact assessments, serves to bring environmental concerns to the forefront for consideration in decision-making and may stimulate changes in project design. Specific approaches and methods used by federal agencies are categorized and described in the remainder of this chapter. Figure One indicates which methods are used by each program.

In order to provide background information for the assessment of potential relationships between the '201' Wastewater Treatment Works Program and other federal agency programs, it is important to identify the way in which each method for reducing impacts on floodplain development is implemented. Key questions related to implementation include the following:

- Is the method authorized through a required regulation, an "advisory" program guideline, or through grant conditions?
- Which level of government (federal, state, or local) is responsible for implementing the floodplain development impact approach?
- Is the approach used primarily for flood hazard reduction, for floodplain management and development control, or environmental protection?

These questions are answered for each floodplain impact mitigation method.

Interviews with representatives of federal agencies as well as federal program regulations and guidelines provided the major source of information for this chapter.

Engineering works for drainage, flood control, and hydroelectric power and housing assistance programs were not reviewed for floodplain development impact mitigation measures. Although public works and housing assistance projects can have an effect on development in floodplain areas, the relationship is somewhat different from public facilities and transportation projects which are often necessary pre-requisites for urban development. Since the '201' Wastewater Treatment Works Program funds public facilities, it was hypothesized that planning and construction programs related directly to urban development would be more likely than public works projects and housing assistance programs to use methods for reducing floodplain development pressures which would be transferrable to the '201' Program of the U.S. Environmental Protection Agency.

At the time of this report (February, 1978), federal agencies are in the process of revising or developing new floodplain development mitigation methods in order to implement President Carter's Executive Order on Floodplain Management. The Order directs all federal agencies to take appropriate measures to minimize unwise floodplain development which can lead to loss of human and other natural resources. If an agency proposes to allow an activity to take place in the floodplain, the agency must consider alternatives to avoid adverse effects and incompatible development in the floodplain.

The Coastal Energy Impact Program and the '404' Permit Program are the only two federal programs reviewed where specific procedures have been adopted related to implementation of the new Executive Order. It is expected that by Spring, 1978, many other agencies will have adopted specific provisions in order to discourage the location of federally funded facilities inside of floodplains. Therefore, the concern in this chapter is with the methods and approaches used by federal agencies to reduce or mitigate floodplain development pressures as well as with the content of the requirements. Within several months, federal agency provisions related to floodplain locations and development are expected to change.

B. Direct Regulation of Land Uses in the Floodplain

Several federal agency programs reduce floodplain development pressures by requiring federal, state or local land use regulation programs. The term "regulation" as used in this section refers to the control of land uses or activities in floodplains through permit systems or other controls which provide for the review and approval of proposed activities before those activities take place. The way in which floodplain development is affected through such regulations is described in this section.

The following programs include requirements which affect the regulation of development in floodplain areas:

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FIGURE ONE
FLOODPLAIN IMPACT MITIGATION MEASURES USED BY FEDERAL PROGRAMS

TYPE OF FLOODPLAIN DEVELOPMENT CONTROL MEASURE FEDERAL PROGRAMS REVIEWED	REGULATION OF LAND USES AND ACTIVITIES IN FLOODPLAINS	FLOODPLAIN IMPACT POLICIES	ENVIRONMENTAL ASSESSMENT PROCEDURES
PLANNING:			
1. '701' Comprehensive Planning Assistance Program (HUD)			X
2. '208' Areawide Water Quality Management Program (EPA)	X		X
3. Coastal Zone Management Program (OCZM)	X		X
4. Urban Studies Program (OCE)			X
FLOODPLAIN REGULATION OR CONTROL			
1. National Flood Insurance Program (HUD)	X		
2. '404' Permit Program (ACE)	X		X
3. NPDES Permit Program (EPA)	X		X
CONSTRUCTION			
1. Federal-Aid Highway Program (FHWA)		X	X
2. Urban Mass Transportation Program (UMTA)			X
3. Public Works Program (EDA)			X
4. Coastal Energy Impact Program (OCZM)			X
5. Community Development Block Grants (HUD)			X
6. Sewer and Water Facilities Program (FMHA)		X	X
7. '201' Wastewater Treatment Works Program (EPA)		X	X

- Coastal Zone Management Program;
- '208' Areawide Water Quality Management Program;
- '404' Permit Program;
- National Pollutant Discharge Elimination System Permit Program; and the
- National Flood Insurance Program.

The '404' Permit Program and the National Pollutant Discharge Elimination System Permit Program involve regulation by state and federal agencies. The other programs include provisions related to regulation at the local government level.

Because the Coastal Zone Management Program and the '208' Areawide Water Quality Management Program relate to floodplain regulations in a similar way, they are reviewed in a single section below. The relationship of the National Flood Insurance Program to local government regulations is also described.

1. Environmental Management Planning Programs: The Coastal Zone Management Program and The '208' Areawide Water Quality Management Program

The Coastal Zone Management Program, administered by the Office of Coastal Zone Management of the U.S. Department of Commerce and the '208' Areawide Water Quality Management Program, administered by the U.S. Environmental Protection Agency, require the adoption of regulatory programs. For the Coastal Zone Management Program, land and water uses having significant effects on the coastal zone must be regulated. Either direct state regulation or the indirect participation of the state through review and approval of local government regulatory programs is required. For the '208' Areawide Water Quality Management Program, a regulatory program for controlling all major sources of pollution must be included in state and areawide plans. Regulatory programs may be administered and enforced by federal, state, or local agencies. Since erosion and runoff problems from urban development are typically problems affecting water quality, this requirement often leads to the inclusion of land use regulatory programs in '208' Program implementation packages.

Neither the Coastal Zone Management Program nor the '208' Areawide Water Quality Management Program requires that regulatory programs control urban development in the floodplain. Floodplain regulations are not typically emphasized in coastal zone management programs submitted by states to the Department of Commerce for review and approval.[1] Typically, however, coastal wetlands, such as marshes and mangrove areas, are included in the coastal zone and regulated by federal, state, and/or local agencies.

Most '208' Areawide Water Quality Management Programs also do not emphasize the regulation of development in floodplains.[2] Although construction practices and related regulatory programs have been recommended in some programs, they rarely focus specifically on the floodplain.

2. '404' Permit Program

The '404' Permit Program, administered by the U.S. Army Corps of Engineers, provides for the regulation by the federal government of structures and activities in navigable waters and wetlands. Under 1977 amendments to the Federal Water Pollution Control Act Amendments, states may be approved to administer '404' permits in inland waters. Since many wetlands are integral parts of floodplains, the '404' Program itself can be considered a method for reducing development impacts.

Under provisions of the '404' Permit Program, dredge and fill activities and other alterations in wetlands require a '404' Permit from the U.S. Army Corps of Engineers. Permits are typically not issued when major environmental impacts will result. In most cases, the permit requirements lead to the prohibition of urban development... including residential, commercial and industrial development... in floodplain areas.

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[1] Interview with Mr. Richard Gardner, Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, (November 9, 1977).

[2] Interview with Mr. James Meek, U.S. Environmental Protection Agency, (November 8, 1977).

3. National Pollutant Discharge Elimination System Permit Program

The National Pollutant Discharge Elimination System Program (NPDES), transferred to many State agencies by the U.S. Environmental Protection Agency, requires that permits be obtained for all point source discharges, including discharges from municipal waste treatment facilities and industries. The primary factor considered in issuing an NPDES permit is the impact on water quality.

Under the regulations of the NPDES Program, a "new source" is any discharger whose construction begins after the publication of EPA standards of performance for that industry. EPA requires that environmental assessments be prepared on "new source" NPDES permits. Specific provisions are reviewed in a later section of this report.

The regulation of discharges through the NPDES Permit Program affects municipal treatment facilities and industries which discharge wastes. These activities are frequently located in floodplain areas since they discharge into rivers and streams. Although the NPDES Permit Program provides important water quality protection which has implications for preservation of the natural floodplain environment, floodplain development is not generally considered in permit decisions.

4. National Flood Insurance Program

Under the provisions of the Flood Disaster Protection Act of 1973, federal financial assistance for construction and acquisition in the floodplain will be denied in areas where local governments have identified flood-prone areas but where minimum floodplain regulations have not been adopted. In addition, many federal programs require that structures constructed with federal monies be covered by national flood insurance. This second provision also encourages local governments to adopt floodplain regulations.

Although the National Flood Insurance Program does not directly regulate development in the floodplain, it directs local governments to adopt appropriate flood hazard control regulations. These regulations typically relate to the location of structures and construction standards. The regulations are designed to protect structures from flood damage, and do not address the environmental values of the floodplains. A frequent side-effect of the flood hazard regulations, however, is the protection of the natural floodplain. In some cases, the regulations have the economic effect of making floodplain development prohibitively expensive.

5. Assessment of Regulatory Approaches

By definition, regulatory programs control certain activities and uses. All of the programs reviewed in this section mandate regulatory programs which can affect floodplain areas.

There is a difference, however, between a regulatory program which affects floodplain development, and one which is directed specifically toward the control of floodplain development. Only the '404' Permit Program and the National Flood Insurance Program are directed specifically toward the control of floodplain development. In the case of the '404' Program, the focus extends only to wetlands and not to the entire floodplain. In the case of the National Flood Insurance Program, the concern is flood hazard protection rather than protection of the natural values of the floodplain. None of the federal programs which require regulatory programs are directed toward floodplain protection, although they can result in floodplain protection.

The Coastal Zone Management Program, the '208' Areawide Water Quality Management Program, and the National Flood Insurance Program implement regulatory provisions through specific grant restrictions. In the case of the National Flood Insurance Program, grants from a number of federal programs, including the '201' Wastewater Treatment Works Program, are available only if requirements of the National Flood Insurance Program are followed.

C. Floodplain Development and Management Policies

A policy is a statement indicating the direction in which a program is to be administered and is designed to insure that certain goals are met. The adoption of specific policies concerning floodplain development, preservation, and management is a second type of method which is being used by several federal programs to mitigate or reduce floodplain development impacts.

In the broadest sense of the word, the regulatory programs discussed in the previous section of this chapter and the environmental assessment requirements discussed at the end of this chapter reflect policies of federal agencies.

The policies reviewed in this section, in contrast, are broad statements of intent and direction, and are not specific regulatory requirements or requirements for environmental assessment procedures. The policies reviewed here include specific provisions related to floodplain development.

Although not reviewed in detail in this section, all federal programs reviewed in this report which fund structures in the floodplain include specific requirements relating to flood hazard protection, as required by the National Flood Insurance Program. Three federal agencies... the Federal Highway Administration, the Environmental Protection Agency, and the Farmers Home Administration... have developed specific policies relating to the location of facilities in floodplain areas. Although these policies are primarily directed toward the protection of federal investments from flood damage, the implementation of the policies helps to protect natural values of floodplains. These policies are reviewed below.

1. Federal-Aid Highway Program

The Federal Highway Administration has adopted a specific floodplain policy which affects the Federal-Aid Highway Program and states the following:[3]

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[3] 23 Code of Federal Regulations Part 650, Section 650.103.

> "It is the policy of the Federal Highway Administration to encourage a broad and unified effort to prevent uneconomic, hazardous or unnecessary use and development of the Nation's floodplains, and in particular to lessen the risk of flood losses in connection with federally-financed improvements; and to comply with the 'Flood Hazard Evaluation Guidelines for Federal Executive Agencies,' May, 1972, published by the Water Resources Council. It is the policy of the Federal Highway Administration that, where practicable, highway locations shall avoid areas subject to flooding."

Although the major concern of this policy is flood hazards and damage to federally-funded projects, it is a policy which influences the location of highways in floodplains.

The floodplain policy is implemented through specific regulations pertaining to the design of highways. These regulations mandate that where encroachment on a floodplain is necessary, highways must be designed to permit conveyance of the 100-year flood without causing significant damage to the highway, the stream or other property.[4] A similar policy is in effect for all programs of the U.S. Department of Transportation, issued by the Office of the Secretary of Transportation.

2. '201' Wastewater Treatment Works Program

The U.S. Environmental Protection Agency (EPA) has several specific policies related to floodplains. Policies relate to '201' facility plan preparation and environmental impact assessments.

In order to assist agencies participating in the '201' Wastewater Treatment Works Program, technical assistance materials titled "Guidance for Preparing a Facility Plan" have been prepared.[5] Specific guidance is provided concerning the location of facilities in floodplains.

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[4] *Ibid.*, Section 650.107.

[5] U.S. Environmental Protection Agency, "Guidance for Preparing a Facility Plan", Revised, p. 14, (May, 1975).

When evaluating and choosing sites for treatment plants, interceptors, and related works, the following factor, among others, should be followed:

> "Locate treatment plants and other facilities in general outside of the floodplains. Where such locations are not practicable or would lead to excessive costs, the plant and equipment will be protected against flooding...".

In addition, the regulations of EPA for the preparation of environmental assessments and environmental impact statements specify that when projects may induce construction in a floodplain, resulting flood hazards should be evaluated and practicable alternatives considered. The purpose of the evaluation is "to preclude the uneconomic, hazardous, or unnecessary use of floodplains, to minimize the exposure of facilities to potential flood damage, lessen the need for future federal expenditures for flood protection and flood disaster and preserve the unique and significant public value of the floodplain as an environmental resource."[6]

EPA also has a policy statement titled "Protection of the Nation's Wetlands" which provides that funding for construction, which may interfere with existing wetlands ecosystems, will not be granted unless no other alternative of lesser environmental damage is found to be feasible.[7]

The floodplain policies of the U.S. Environmental Protection Agency are implemented in two ways. First, the policies are used by local agencies preparing '201' facilities plans. Second, the policies are used by EPA when '201' facility plans are reviewed and, if necessary, special conditions are placed on grants for engineering design and facility construction.

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[6] 40 Code of Federal Regulations, Section 6.214(b)(2).

[7] 40 Federal Register 10834, (May 2, 1973).

3. Sewer and Water Facility Loan and Grant Program

The Sewer and Water Facility Loan and Grant Program of the Farmers Home Administration includes specific provisions related to floodplain locations in the Program Planning Manual. The provisions are guidance materials for use in preparing facilities plans.

The floodplain policy of the Farmers Home Administration is as follows:[8]

> "Location of facilities in floodplain area. Ordinarily facilities will not be located in the 100 year floodplain level except for supply and treatment plants in which event applicants will evaluate the proposal from the standpoint of special design and additional initial and maintenance costs, and provide FmHA with the recommendations of appropriate agencies such as the U.S. Army Corps of Engineers, the Soil Conservation Service (SCS), or the appropriate State official. Facilities located in special flood and mudslide-prone areas must comply with the eligibility and insurance requirements..."

This policy is implemented through specific design standards relating to engineering and architectural practices. The concern addressed through this policy provision is flood hazard protection rather than protection of the natural values of floodplains. Special conditions are attached to grants or loans from the Farmers Home Administration to make sure that the grantee conforms with this flood hazard protection policy.[9]

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[8] 7 Code of Federal Regulations, Section 1933.18, Appendix B.

[9] Telephone interview with Mr. Glen E. Walden, Farmers Home Administration, U.S. Department of Agriculture, (January 29, 1978).

4. Assessment of Floodplain Policies

Although there are numerous federal agency requirements related to the need to plan for floodplain development or identify environmental impacts in the floodplain, few programs have specific policies concerning the location of facilities in the floodplain.

The Federal Highway Administration and the Environmental Protection Agency have policies which must be followed for each federal project. The Environmental Protection Agency also addresses floodplain development through guidance materials. The floodplain policy administered by the Farmers Home Administration is program guidance, recommended for use but not mandatory.

The Federal Highway Administration policy and the Farmers Home Administration policy are directed toward flood hazard protection. On the other hand, the policy of the Environmental Protection Agency is directed toward protection of the natural values of floodplains as well as flood hazards.

The policies of each of the three federal agencies reviewed in this section are implemented through engineering and design standards. Only the U.S. Environmental Protection Agency enforces the policies through special grant conditions.

D. Environmental Assessment Procedures

The National Environmental Policy Act requires federal agencies to assess the environmental impacts of their actions and to prepare Environmental Impact Statements on major federal agency actions. An environmental assessment is an identification of environmental factors related to a project and must be completed even if a complete Environmental Impact Statement is not prepared. Environmental assessments are also used to determine whether an Environmental Impact Statement is needed.

The precise form and content of environmental assessments on federal projects varies among agencies. The Council on Environmental Quality has, however, promulgated specific regulations on the form and content of Environmental Impact Statements (EIS). Since EIS procedures are uniform for all federal agencies, EIS procedures are not reviewed in detail in this report.

This section reviews environmental assessment approaches used by several programs, as well as Environmental Impact Statement provisions which address floodplain impacts and secondary development impacts.

Environmental assessment and Environmental Impact Statement provisions for the following programs are reviewed in this section:

- Federal-Aid Highway Program;
- Urban Mass Transportation Program;
- Coastal Energy Impact Program;
- Urban Studies Program;
- Public Works Program;
- Sewer and Water Facility Loan and Grant Program;
- '201' Wastewater Treatment Works Program;
- Community Development Block Grant Program;
- '701' Comprehensive Planning Assistance Program;
- '404' Permit Program;
- NPDES Permit Program;
- '208' Areawide Water Quality Management Program; and
- Coastal Zone Management Program.

Environmental assessment procedures and provisions used in each of these federal programs, with special emphasis on provisions related to floodplains and secondary development impacts, are described below. The final section highlights the differences and similarities of environmental assessment approaches.

The National Environmental Policy Act requires that federal agencies identify environmental impacts related to projects so that program decisions can reflect environmental considerations. The degree to which environmental assessments are used by federal agencies in decision-making was not assessed in this study.

1. Federal-Aid Highway Program

As previously described, it is the policy of the Department of Transportation to direct highways and related facilities to locations outside of the floodplain whenever practicable. It is also the policy of the Federal Highway Administration to give full consideration to social, economic and environmental effects throughout the planning of highway projects to ensure that such considerations are incorporated into the decision making process, and that decisions are made in the overall public interest.[10]

The first major planning activity affecting highways is the Environmental Action Plan which is prepared by each state in response to requirements of the U.S. Department of Transportation. Specific highway projects should be based on the Environmental Action Plan.

When project planning is undertaken by states, the following stages are carried out:

- System Planning Stage - Regional analysis of transportation needs and the identification of transportation corridors;
- Location Stage - From the end of system planning through the selection of a particular location; and
- Design Stage - From the selection of a particular location to the start of construction.

It is the policy of the Federal Highway Administration to provide for the full consideration of environmental impacts at each stage of planning. A complete Environmental Impact Statement is prepared, if necessary, during the design stage of project planning.

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[10] Federal Highway Administration, U.S. Department of Transportation, "Federal-Aid Highway Program Manual", Volume 7, Chapter 7, Section 1(4), (December 30, 1974).

Environmental impact assessment requirements for highway planning are incorporated in an eight-volume Program Manual. The Manual identifies the guidelines for identifying environmental impacts related to the State Environmental Action Plan. Reflecting requirements of the National Environmental Policy Act, the program guidelines emphasize a systematic, interdisciplinary approach for environmental impact assessment, the integration of the information into the decision making process, and the identification of alternatives. The State Environmental Action Plan should identify procedures to be followed to insure that potential environmental effects are identified in later stages of planning (the location and design stages) and that provision is made for the reconsideration of earlier decisions which may be needed as a result of new information or the passage of time.[11] Specific guidelines related to the assessment of floodplain impacts are not included in the Federal-Aid Highway Program Manual.

The Federal-Aid Highway Program has detailed guidelines and regulations pertaining to Environmental Impact Statements. The specific requirements of Executive Order 11296 concerning the evaluation of flood hazards are incorporated in the Manual.

A major concern related to secondary impacts of highways is emphasized in the guidelines:[12]

> "Highways may stimulate or induce other actions (secondary actions) such as more rapid land development or changed patterns of social and economic activities. Impacts associated with secondary actions, through their impacts on existing community facilities and activities, through inducing new facilities and activities or through changes in natural conditions may often be even more substantial than the primary impacts associated with construction of the highway."

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[11] Ibid., Volume 7, Chapter 7, Section 1(14).

[12] Federal Highway Administration, U.S. Department of Transportation, Federal-Aid Highway Program Manual, Volume 7, Chapter 7, Section 2, "Environmental Impact and Related Statement," Section 19, p. 28, (January 2, 1976).

One section of the Environmental Impact Statement must describe significant impacts on wetlands and coastal zone areas, and where applicable, set forth any inconsistencies with wetlands or coastal zone management programs.[13]

When a project alternative being considered significantly encroaches on a floodplain, a flood hazard evaluation section must be included in the Environmental Impact Statement. The Statement must summarize studies and consultation made for compliance with flood hazard requirements.[14]

Responsibility for determining whether a Federal-Aid Highway Project is a "major" action for which an Environmental Impact Statement is required lies with the highway agency (often a local or state agency) with primary responsibility for initiating and carrying forward the action. The Federal Highway Administration Division Engineer, after a review of the recommendations and supporting data from a highway agency, may concur in the highway agency's determination or request additional information. Typically, a new freeway or a highway which provides new access to an areas and is likely to affect development patterns is considered a major project requiring an Environmental Impact Statement. The preparation of the Environmental Impact Statement is the responsibility of the state or local highway agency.

2. Urban Mass Transportation Program

The Urban Mass Transportation Administration, U.S. Department of Transportation, follows specific procedures in assessing environmental impacts in compliance with the National Environmental Policy Act. The environmental assessment procedures apply to grants, loans, contracts, regulatory actions, plans submitted for approval, and other actions of the Urban Mass Transportation Administration.[15]

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[13] Ibid., page 32.

[14] Ibid., page 32.

[15] 39 Federal Register No. 190, U.S. Department of Transportation, Section 3, (September 30, 1974). These guidelines apply to most Department of Transportation programs, although they are not the primary guidance material used by the Federal-Aid Highway Program, as described in another section of this report.

Environmental impacts of activities proposed through Urban Mass Transportation Administration programs must be assessed at the same time that initial technical and economic studies are prepared. The Department of Transportation has general criteria for the identification of social, economic and environmental impacts.[16]

Each applicant for a grant, loan, or other approval of the U.S. Department of Transportation may be requested to submit an environmental analysis of the proposed project with the application. It is the responsibility of the Urban Mass Transportation Administration to make its own evaluation of environmental issues, since the agency is responsible for the scope and content of Environmental Impact Statements.[17] Requirements related to secondary development and floodplain impacts are not specified. The environmental review is carried out by Regional offices and the Washington, D.C. Office. Final project approval is made in Washington, D.C.

For a major investment such as a rapid rail system, the Washington Office works with the grantee from the early, formative stages of the project to make sure that environmental factors are definitely considered and that initial work on the Environmental Impact Statement is initiated.

For minor investments such as a bus garage, an Environmental Assessment Report is submitted by the grantee to the Washington office to determine whether the investment is a "significant action". If it is a significant action, an Environmental Impact Statement is developed through the joint efforts of grantee and the Urban Mass Transportation Administration Office in Washington, D.C.[18]

Major federal actions significantly affecting the environment usually include the following:[19]

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[16] Ibid., Section 6.

[17] Ibid., Section 7(e).

[18] Interview with Mr. Kiyoshi Mano, Environmental Specialist, Urban Mass Transportation Administration, U.S. Department of Transportation, (November 10, 1977).

[19] Ibid., Attachment I(2).

- Any action that is likely to have a significantly adverse impact on natural, economical, cultural, or scenic resources, of national, state, or local significance;
- Any action that is likely to be highly controversial on environmental grounds; or
- Any action that causes a significant disruption of the community, is inconsistent with plans and goals of the community in which the project is located, or causes a significant increase in congestion.

Projects which are individually limited but cumulatively significant, as well as individual projects, may be determined to be significant federal actions and require an Environmental Impact Statement.

The general contents of the draft or final Environmental Impact Statement should include a description of the action, including secondary population and growth aspects, and the probable environmental impact of the project, including secondary impacts from growth.[20]

When an alternative under consideration encroaches on a floodplain, the Environmental Impact Statement must include evidence that studies have been made and consultations with other agencies carried out. Necessary measures to handle flood hazard problems should be described, in compliance with federal flood hazard requirements.[21]

If wetlands or coastal zone areas are involved, an assessment of the impacts of the project on wetlands and associated wildlife must be provided. Statements from appropriate federal officials in the Department of the Interior concerning the impacts on the wetlands are needed.[22]

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[20] *Ibid*., Attachment 2.

[21] *Ibid*., Attachment 2, Section 11.

[22] *Ibid*., Attachment 2, Section 12.

3. Coastal Energy Impact Program

The Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, U.S. Department of Commerce has published guidelines for the preparation of Coastal Energy Impact Program Project Assessments and Environmental Impact Statements. The guidelines specify the detailed environmental information required in applications for certain kinds of financial assistance. The guidelines insure that adequate environmental information for project decisions and Environmental Impact Statements is provided by the applicant.[23]

Each applicant requesting Coastal Energy Impact Program funding for a proposed project must complete an environmental impact assessment. The assessment documents the analysis of environmental impacts of alternative courses of action studied. The Office of Coastal Zone Management uses the assessment to determine whether an Environmental Impact Statement must be prepared in accordance with the National Environmental Policy Act. The assessment also assists the applicant in selecting the best course of action.[24]

The environmental assessment information requirements reflect the requirements of the National Environmental Policy Act. A description of the project, project alternatives, project design factors, documentation of compliance with state and local environmental permits and procedures, and related types of information are required.

Areas of environmental concern which are regulated by federal law are identified in the guidelines. Factors relating to floodplain impacts include the following:[25]

- Impact of the project on local zoning regulations;
- Impact of the project on other community facilities;

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[23] 42 Federal Register No. 171, National Oceanic and Atmospheic Administration, U.S. Department of Commerce, (September 2, 1977).

[24] Ibid., Section I, CEIP Guidelines, Environmental Assessment Information.

[25] Ibid, Section B, Guidelines for Analyzing Significant Environmental Impacts.

- Location of the project in relationship to environmental features, including wetlands, floodplains, and wildlife habitats, among others (a small scale map showing environmental features is required);

- Impact on floodplains and provisions for implementing Executive Order 11296 (including the review of alternative locations outside of the floodplain unless there is no other practicable alternative), and designing the project to minimize harm to the floodplain, meet flood proofing standards, and insure that the project is in compliance with the Flood Disaster Protection Act if no alternative is available;

- Impact on wetlands, including provisions for compliance with Executive Order 11990 mandating avoidance of wetland locations unless there is no practicable alternative (a Section 404 permit from the U.S. Army Corps of Engineers must be obtained prior to submission of the application for Coastal Energy Impact Program funding).

Other environmental concerns relate to land use, noise, water quality, wastewater treatment plants, solid waste management, human population, transportation, wild and scenic rivers, and historic preservation.

In order to assess impacts on local zoning regulations and community facilities, the relationship of the project to secondary development must be determined. Therefore, both secondary development impacts and floodplain impacts must be considered in the environmental assessment process.

Provisions related to Environmental Impact Statements follow requirements of the National Environmental Policy Act and do not include additional provisions related to wetlands, floodplains, or secondary development.

4. Urban Studies Program

The U.S. Army Corps of Engineers, in conducting Urban Studies in metropolitan areas, prepares an environmental assessment on alternative plans being considered. The responsibility for preparing the environmental assessments lies with the Urban Studies Project Office of the U.S. Army Corps of Engineers, with review and approval from the District Engineer from the Army Corps of Engineers and other local sponsoring agencies.

For the environmental assessment of alternative plans, the regulations of the Corps of Engineers direct a process which meets the requirements and format of the Water Resources Council Principles and Standards, the National Environmental Policy Act, the River and Harbor Act and the Flood Control Act of 1970.

Figure Two summarizes the impact assessment process for planning purposes. As stated in the regulations, impact assessment is an objective analysis conducted to identify and measure the likely economic, social and environmental effects of each alternative plan. These effects, when analyzed, form the basis for evaluating the beneficial and adverse contributions of the plans.[26]

As shown on Figure Two, the description of base conditions and the identification of alternative plans are basic information used in the impact assessment process. Specific impact assessment activities include the determination of sources of impacts, the identification of impacts, the specification of the incidence of the impacts, and the measurement of the impacts. Impacts are summarized in terms of economic, social, and environmental factors.

The regulations do not include detailed requirements for the identification of secondary development impacts or floodplain impacts. It is recognized that the type of

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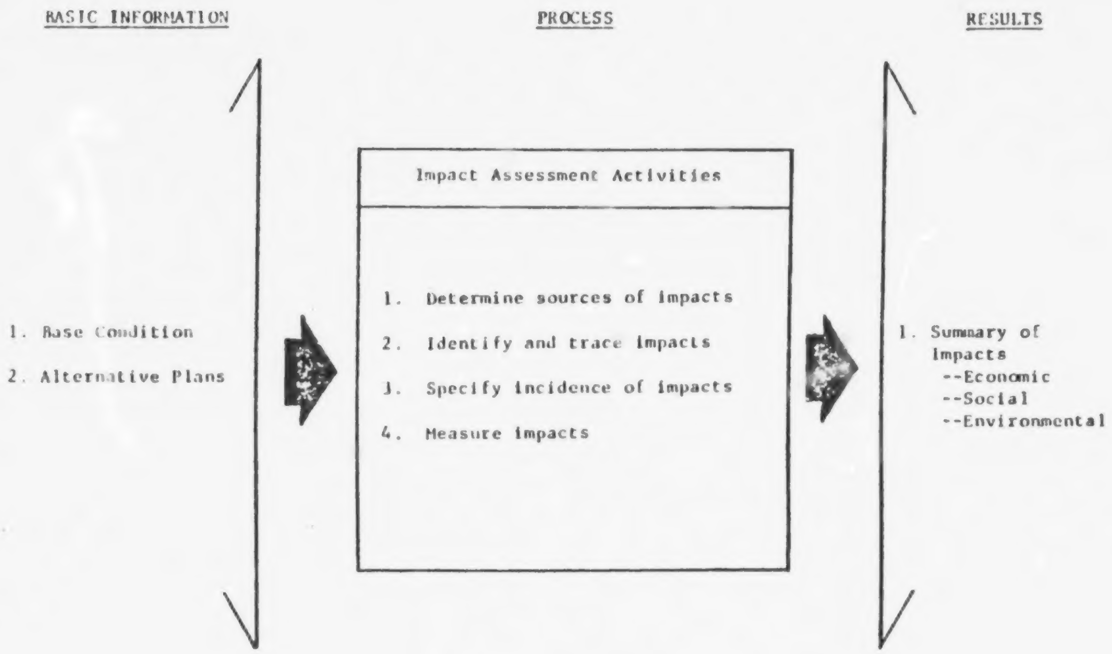
[26] Department of the Army, Office of the Chief of Engineers, Regulation No. 1105-2-240, "Planning - Planning Process: Impact Assessment", Section 6, (November 10, 1975).

FIGURE TWO

IMPACT ASSESSMENT PROCESS USED BY THE CORPS OF ENGINEERS


BASIC INFORMATION
PROCESS
RESULTS
1. Base Condition
2. Alternative Plans
Impact Assessment Activities
1. Determine sources of impacts
2. Identify and trace impacts
3. Specify incidence of impacts
4. Measure impacts
1. Summary of Impacts
--Economic
--Social
--Environmental

SOURCE: Department of the Army, Office of the Chief of Engineers, "Planning - Planning Process: Impact Assessment", November 10, 1975, p. 3.

environmental assessment conducted will reflect the level of detail of the alternatives. Refinement of the assessment process occurs when planning activities move into different stages.[27]

In "Guidelines for Assessment of Economic, Social and Environmental Effects of Civil Works Projects", however, a specific step for identifying the full range of causative factors is identified. The importance of identifying the inter-relatedness of economic, social, and environmental aspects is noted. It is intended that aspects of the impact assessment process relating to the environment be used in completing Environmental Impact Statements, if needed.

5. Public Works Program

The Economic Development Administration, U.S. Department of Commerce, follows specific procedures in identifying and reviewing environmental impacts of proposed grants for public works facilities.

Before an application for funding is made under the Public Works Program, the state representative of the Economic Development Administration completes an environmental assessment. In completing the assessment, consideration is given to all potential impacts associated with the construction of the project. A checklist of environmental factors is used as an aid to the initial identification of environmental impacts, one specific factor listed is floodplain uses. Procedural guidance directs the preparation of environmental assessments which are as specific as the economic, engineering, and technical information permits at this early review stage.[28] If certain environmental information is not available, it may be added at a later date.

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[27] *Ibid.*, p. 3.

[28] Economic Development Administration, U.S. Department of Commerce, "EDA Program to Implement the National Environmental Policy Act of 1969 and Other Federal Environmental Mandates as Required", Transmittal No. 12.02-2, Appendix A, (July, 1976).

According to "Guidelines for Determining Significant Environmental Impacts" of the Economic Development Administration, primary and secondary impacts, including land use and community services impacts, must be considered when preparing environmental assessments. A consideration of the following factors could lead to a finding that a significant impact on either an individual or cumulative project basis would result:[29]

- If a project will result in an extensive change in land use or the commitment of a large amount of land;
- If the land use change is incompatible with the existing or planned land use of the surrounding area;
- If a project will affect in large measure wildlife populations and their habitats, important natural resources, floodplains, wetlands, and other ecological areas.

The environmental assessment for a public works project should be completed prior to a pre-application conference, or notification to the applicant that a formal application may be filed. The assessment must be provided to the Regional Office of the Economic Development Administration for review.[30]

The applicant is required to provide the factual information necessary for the evaluation of the project's environmental impacts.

The environmental assessment completed by the Regional Office is more detailed than the assessment completed by the state representative. Regional Office staff may consult with other federal, state and local agencies in completing the review. The environmental assessment should include a discussion of adverse impacts and alternatives for reducing the impacts.[31] The Regional Office determines whether an Environmental Impact Statement is necessary.

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[29] _Ibid._, Appendix B.

[30] _Ibid._, 17.02-2.05(3)(2)(b).

When it is determined that a project has the potential for significantly affecting the quality of the human environment, the Regional Office prepares a discussion paper which is similar to a proposed draft impact statement. This paper is coordinated with the Deputy Assistant Secretary for Environmental Affairs in the Washington, D.C. Office of the Economic Development Administration. Additional provisions apply to the completion of the final Environmental Impact Statement.

6. Sewer and Water Facility Loan and Grant Program

The Farmers Home Administration follows specific procedures in reviewing environmental impacts of projects proposed for funding, in compliance with the National Environmental Policy Act. Detailed guidance and information on the National Flood Insurance Program is provided to applicants.

Before applications for sewer and water loans and grants are received, the County Officer of the Farmers Home Administration prepares an environmental assessment report which is transmitted to the State Office. If floodplain impacts are significant, they should be identified at this stage in the administrative process.[32]

After the State Office approves the preparation of an application, the local agency prepares the formal application, including a request for funds for completing a preliminary facility study. As described in the policy section of this chapter, if the proposed facility is in the floodplain, the State Office of the Farmers Home Administration requests that the applicant try to relocate the facility.

Final approval of the application is made by the State Office of the Farmers Home Administration. The State Office also determines whether an Environmental Impact Statement is required, and in such cases, prepares the Environmental Impact Statement.[33]

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[31] *Ibid.*, Appendix D.

[32] Interview with Mr. Glen E. Walden, Farmers Home Administration, U.S. Department of Agriculture, (November 10, 1977).

7. '201' Wastewater Treatment Works Program[34]

Regulations of the Environmental Protection Agency require applicants for '201' facilities grants to prepare environmental assessments.[35] Environmental assessments provide information which is used for determining whether an Environmental Impact Statement is required and also provide information on potential environmental impacts of the facilities. Environmental assessment provisions apply to the following administrative actions:[36]

- Approval of most '201' facilities plans;
- Awards of Step 2 and Step 3 grants if an approved facilities plan was not required; or
- Award of a Step 2 or Step 3 grant when either the project or its impact has changed significantly from that described in the approved facilities plan.

An adequate environmental assessment must be an integral, although identifiable, part of any '201' facilities plan submitted to the U.S. Environmental Protection Agency.

In order to obtain information for use in the environmental assessment, consultation with the following offices is required:[37]

- Local and regional land use planning agencies for assessments of land use trends and population projections, especially those affecting size, timing, and location of facilities, and Section '701' comprehensive planning;

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[33] Ibid.

[34] Many of these provisions for environmental assessments also apply to '208' water quality management plans. For this reason a special section on environmental assessment procedures used by the '208' program is not included in this paper.

[35] 40 Code of Federal Regulations Section 35.925.8.

[36] 40 Code of Federal Regulations . 6.500.

[37] Ibid., Section 6.512(a).

- The Regional Office of the U.S. Department of Housing and Urban Development, if a project involves a flood risk area identified under the Flood Disaster Protection Act;
- The State coastal zone management agency if the coastal zone is affected;
- The Secretary of the Interior or Secretary of Agriculture if a wild and scenic river is affected;
- The Secretary of the Interior or Secretary of Commerce, if a threatened or endangered species is affected; and
- The Fish and Wildlife Service (Department of the Interior), the Department of Commerce, and the U.S. Army Corps of Engineers, if wetlands are affected.

Depending upon the particular situation, additional agency consultations are carried out.

Both primary and secondary impacts of the proposed action must be described. Special attention must be given to induced changes in population patterns and growth.[38] Steps to minimize adverse impacts may include changes in facility design, size and location, the staging of facilities construction and the development and enforcement of land use regulations and environmental protection regulations.

If an action may directly cause or induce the construction of buildings or other facilities in a floodplain, flood hazards must be evaluated.[39] As far as practicable, alternatives to preclude the uneconomic, hazardous, or unnecessary use of floodplains to minimize the exposure of facilities to potential flood damage, lessen the need for future federal expenditures for flood protection and flood disaster relief, and preserve the unique and significant public value of the floodplain as an environmental resource must be considered.

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[38] Ibid., Section 6.5121(a)(5) and (6). U.S. Environmental Protection Agency, PRM 75-26 titled "Consideration of Secondary Environmental Effects in the Construction Grants Process" provides additional direction related to the assessment of secondary impacts.

New program guidelines for the '201' Wastewater Treatment Works Program are being prepared in response to President Carter's Executive Orders on Wetlands and Floodplains.

Using the environmental assessment information, an environmental review is conducted by EPA. The environmental review must be undertaken on a continuing basis, starting at an early point in project planning. The environmental assessment must include a review of the proposed action and environmental assessments received. The purpose of the review is to determine whether significant impacts are anticipated, whether any changes can be made in the project, and whether an Environmental Impact Statement is required.[40]

An Environmental Impact Statement must be prepared on a treatment works facilities plan if the treatment works will induce significant changes (either absolute changes or increases in the rate of change) in industrial, commercial, agricultural, or residential land use concentrations or distributions. Factors that should be considered in determining if these changes are significant include, but are not limited to the following:[41]

- The vacant land subject to increased development pressure as a result of the treatment works;
- The increases in population which may be included;

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[39] *Ibid.*, Section 6.214(b).

[40] *Ibid.*, Section 6.204.

[41] *Ibid.*, Section 6.510(a).

- The faster rate of change of population;
- Changes in population density;
- The potential for overloading sewage treatment works;
- The extent to which landowners may benefit from the areas subject to increased development;
- The nature of land use regulations in the affected area and their potential effects on development; and
- Deleterious changes in the availability or demand for energy.

An Environmental Impact Statement must also be prepared if any major part of the treatment works will be located on productive wetlands or will have significant primary or secondary effects on wetlands.[42] A draft "Manual for Preparation of Environmental Impact Statements for Wastewater Treatment Works and '208' Areawide Water Quality Management Plans" and a manual pertaining only to the '201' Wastewater Treatment Works Program have been prepared by EPA as technical assistance materials.

8. Community Development Block Grant Program

The Office of Community Development and Planning, U.S. Department of Housing and Urban Development, requires that recipients of community development block grant funds assess the environmental impacts of proposed projects. In order to assure that the policies of the National Environmental Policy Act are carried out, grant recipients must comply with Environmental Review Procedures leading to the certification for the release of funds for particular projects of the U.S. Department of Housing and Urban Development.[43]

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[42] *Ibid.*, Section 6.510(b).

[43] 24 *Code of Federal Regulations* Part 38, Section 570.603.

In order to assist local governments in completing environmental assessments, HUD has published a guidance document titled "Environmental Assessment for Project Level Actions." The purpose of an environmental assessment is to provide the basis for a decision concerning the significance of environmental impacts and whether the project should be accepted, rejected, or modified on environmental grounds.[44]

The program guidance materials recommend that the descriptive data be separated from the assessment of environmental impacts. The impacts of the environment on the project (including natural hazards, such as floods) and the impact of the project on the environment (such as damage to vegetation or water quality) must be considered. Guidelines or standards specifically related to floodplain impacts are not included.

Environmental assessments are useful in reviewing alternative approaches to the particular project, and for determining whether the project should be undertaken. Although program regulations specify that financial assistance can be made available if the applicant's proposed project is in conformance with program requirements, HUD guidelines indicate that assistance can be made available only if the applicant's decisions are in conformance with HUD environmental policies and objectives.[45] The recommended environmental analysis is diagrammed on Figure Three which follows.

The environmental assessment guidance is organized so that it can be the basis of an Environmental Impact Statement prepared on projects with major environmental impacts.

The Environmental Review Record is the applicant's performance of the environmental review process pertaining to a particular project. HUD has provided a technical format for the review which applicants may follow. The Environmental Review Record is particularly designed for applicants

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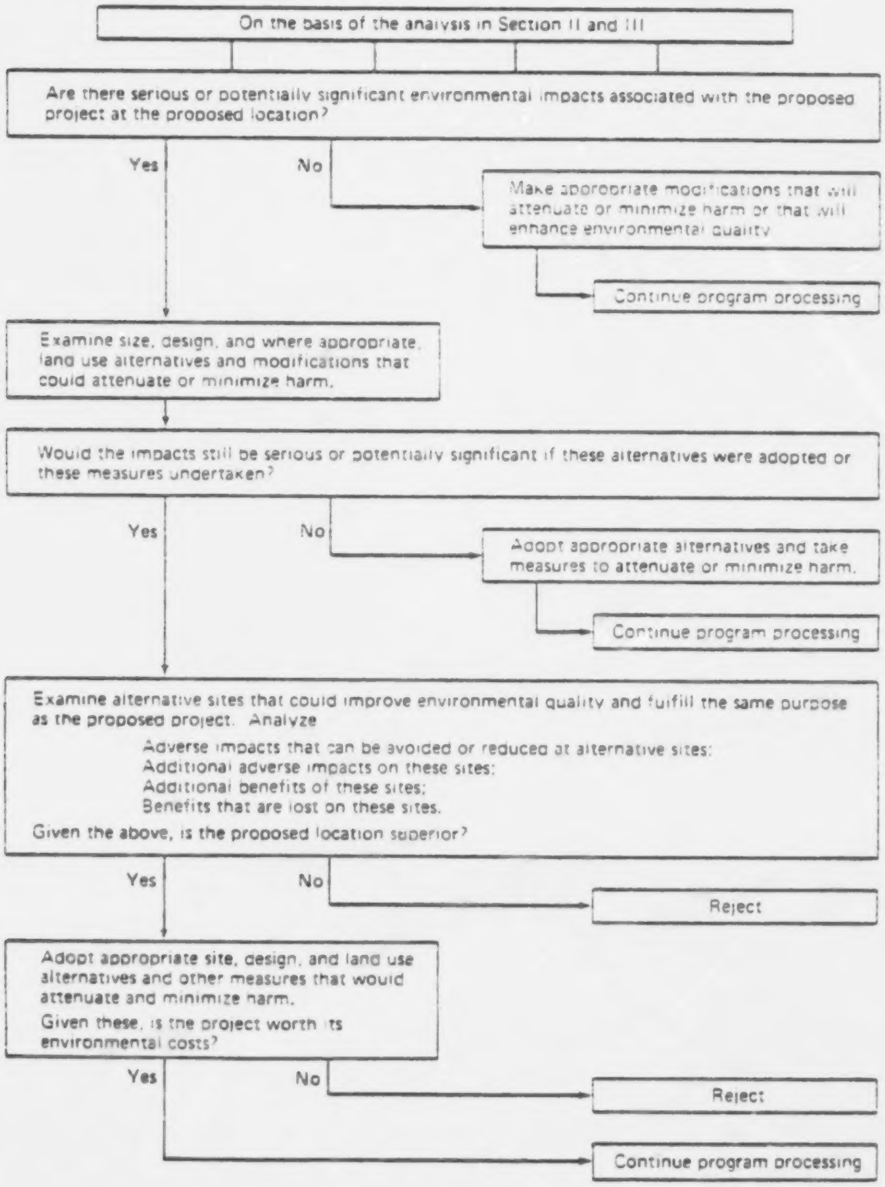
[44] U.S. Department of Housing and Urban Development, "Environmental Assessments for Project Level Actions - A Guidance Document", p. 1, (September, 1974).

[45] Ibid., p. 31.

FIGURE THREE

ENVIRONMENTAL ANALYSIS PROCESS USED BY THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT


On the basis of the analysis in Section II and III
Are there serious or potentially significant environmental impacts associated with the proposed project at the proposed location?
Yes
No
Make appropriate modifications that will attenuate or minimize harm or that will enhance environmental quality
Continue program processing
Examine size, design, and where appropriate, land use alternatives and modifications that could attenuate or minimize harm.
Would the impacts still be serious or potentially significant if these alternatives were adopted or these measures undertaken?
Yes
No
Adopt appropriate alternatives and take measures to attenuate or minimize harm.
Continue program processing
Examine alternative sites that could improve environmental quality and fulfill the same purpose as the proposed project. Analyze
Adverse impacts that can be avoided or reduced at alternative sites;
Additional adverse impacts on these sites;
Additional benefits of these sites;
Benefits that are lost on these sites.
Given the above, is the proposed location superior?
Yes
No
Reject
Adopt appropriate site, design, and land use alternatives and other measures that would attenuate and minimize harm.
Given these, is the project worth its environmental costs?
Yes
No
Reject
Continue program processing

SOURCE: U.S. Department of Housing and Urban Development, "Environmental Assessments for Project Level Actions - A Guidance Document", September, 1974, p. 38.

with no prior experience with environmental reviews. In addition to serving as a guide to the substantive steps in the environmental review process, the Environmental Review Record provides a checklist for procedural requirements specified in "Environmental Review Procedures for the Community Development Block Grant Program".[46]

Information to be contained in the Environmental Review Record includes the following:

- Project data;
- Existing environmental conditions and trends;
- Relevant A-95 matters;
- Comparison of the project with applicable standards and plans (including land use and growth management plans, land use ordinances, floodplain standards, wetland standards, water quality standards, and others;
- Physical factors affecting site-structure-design suitability (including natural hazards);
- Service delivery factors affecting site-structure-design suitability (including the sanitary sewer system);
- Impact of the project on physical aspects of the surrounding environment; and
- Impact of the project on service delivery aspects of the surrounding environment.

The Environmental Review Record must also summarize environmental impacts identified, describe alternatives and environmental safeguards, and state the finding concerning the necessity for an Environmental Impact Statement.[47]

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[46] U.S. Department of Housing and Urban Development, "Environmental Reviews at the Community Level - A Program Guide", p. 1 , (October, 1975).

The Environmental Review Record and the environmental assessment are completed after basic project planning has taken place. However, the guidance materials encourage the review of environmental impacts at every stage in project planning. Since specific steps in project planning are not identified, the degree to which environmental assessments are undertaken during early planning varies. It is usually not possible to complete the Environmental Review Record in detail until the location and basic characteristics of the project are identified.

The responsibilities for completing Environmental Impact Statements and complying with the requirements of the National Environmental Policy Act are delegated to the local agency receiving the grant. The Area Office of the Department of Housing and Urban Development, however, must concur with the findings of the environmental assessment and any Environmental Impact Statement prepared.

9. '701' Comprehensive Planning Assistance Program

All applicants for '701' comprehensive planning assistance grants must prepare an environmental assessment if the planning program will result in development plans or policies for land use, major community facilities, major utility systems, major transportation systems, or the protection of natural areas. Information required in the environmental assessment is similar to information required for Environmental Impact Statements, and includes an identification of adverse impacts which cannot be avoided as well as alternatives to the proposed plan.[48]

One of the required steps in the environmental assessment is the determination of applicable federal, state and local environmental controls. Any proposed deviations from the HUD environmental policies and standards for floodplain management, as included in the National Flood Insurance Program, must be identified.[49] Guidance related to the determination of impacts of secondary development on floodplains, however, is not provided.

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[47] U.S. Department of Housing and Urban Development, "Environmental Reviews at the Community Level - A Program Guide", p. 12, (October, 1975).

[48] 40 Federal Register No. 164, U.S. Department of Housing and Urban Development, Section 600.65(b), (August 22, 1975).

After a '701' planning assistance grant has been received, the applicant must include environmental planning in the comprehensive planning process. Special consideration must be given to environmental dangers or risks (such as floods) and the minimization of undue damage to natural resources.[50]

10. '404' Permit Program

Regulations of the U.S. Army Corps of Engineers require the preparation of an environmental assessment for all '404' permit applications. The environmental assessment must be dated, signed, and placed in the record of the permit application.[51] The purpose of the environmental assessment is to identify important natural and cultural resources on the site and identify potential environmental impacts of proposed projects.

Because of the large number of '404' permit applications received by every Corps District Office, detailed environmental reviews are usually not possible. In some District Offices, however, individual field investigations are completed on the major permit applications. Each District Office uses different environmental impact assessment forms and techniques when completing the assessment.

The importance of the environmental assessment for permit decisions varies with different types of proposed activities and varies among Corps Districts.[52] For large structures such as marinas or major dredge and fill projects, environmental factors are important considerations in reviewing the permit application. The Environmental Protection Agency, the Fish and Wildlife Service, and the National Marine Fisheries Service often provide environmental impact information on the proposed permit application which adds to the environmental assessment completed by the Corps of Engineers.

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[49] 42 Federal Register 6095, Section 600.65(vii), U.S. Department of Housing and Urban Development, (February 1, 1977).

[50] 40 Federal Register No. 164, U.S. Department of Housing and Urban Development, Section 600.65(b), (August 22, 1975).

[51] 42 Federal Register No. 138, "Regulatory Program of the Corps of Engineers", U.S. Department of Defense, Department of the Army, Corps of Engineers, Section 325.2(a)(4), (July 19, 1977).

When an Environmental Impact Statement is required on a proposed permit, the draft Environmental Impact Statement may serve as the environmental assessment.[53]

11. National Pollutant Discharge Elimination System Permit Program (NPDES)

Regulations of the U.S. Environmental Protection Agency require that environmental assessments be prepared on "new source" NPDES permits issued by the Environmental Protection Agency. The provisions do not apply to the issuance of new source NPDES permits by states with approved programs or other types of NPDES permits.

Under the regulations of the NPDES Program, a "new source" is defined as any discharger whose construction begins after the publication of EPA standards of performance for that industry.[54] Regulations for federal performance standards are published for a categorical list of industrial sources identified in Section 306 of the Federal Water Pollution Control Act Amendments of 1972. The list includes categories such as grain mills, cement manufacturing, textile mills, petroleum refining and iron and steel manufacturing.[55] Applicants must submit a new source environmental questionnaire which is used by the Regional Office of EPA to determine whether the proposed discharge is a new source.

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[52] Information based upon interviews with '404' permit offices in the Philadelphia District Office, Baltimore District Office, and the Norfolk District Office, (July, 1977).

[53] Ibid., Section 325.2(a)(4).

[54] 40 Code of Federal Regulations Part 6, Section 6.902.

[55] 33 United States Code Section 1151 et. seq.

When an applicant applies for a new source NPDES permit, the applicant is informed that an environmental impact assessment must be prepared.[56] In most cases, the preparation of the environmental impact assessment is the responsibility of the applicant. The EPA Regional Office is responsible for an environmental review after the environmental impact assessment is received from the applicant.

EPA must furnish the applicant for a "new source" NPDES permit with information concerning the type of the environmental assessment information required. The environmental review completed by EPA must include a review of any environmental assessment information received. EPA's environmental review determines whether any significant impacts are anticipated, whether any changes can be made in the proposed "new source" discharge to eliminate significant adverse impacts, and whether an Environmental Impact Statement (in conformance with the requirements of the National Environmental Policy Act of 1969) is required.[57]

An Environmental Impact Statement must be prepared if the new source will "induce or accelerate significant changes in industrial, commercial, agricultural, or residential land use concentrations or distributions which have the potential for significant environmental effects."[58] The effect of the new source on induced development, air quality, local ambient noise levels, surface or groundwater quality, wildlife habitats, or wetlands are additional factors considered. Although floodplain impacts are not specifically listed in the criteria, the focus on induced land use changes and environmental effects would include developmental impacts in floodplains.

In addition to the impact of the proposed discharge on water quality, the impact of the facility itself on the development in currently undeveloped floodplains must be considered prior to the issuance of an NPDES permit for a "new source" discharger. As stated in the regulations of the U.S. Environmental Protection Agency, if the proposed "new source" will "encourage new industrial, commercial, and residential development in currently undeveloped floodplains which are of significant value for agricultural production, recreation, or wildlife habitat," the responsible official shall act pursuant to Executive Order 11296 on flood hazards.

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[56] 42 Federal Register No. 7, Section 6.908(a), U.S. Environmental Protection Agency, (January 11, 1977).

[57] *Ibid.*, Section 6.908(c).

[58] *Ibid.*, Section 6.910(b).

12. '208' Areawide Water Quality Management Program

The regulations of the U.S. Environmental Protection Agency for the '208' Areawide Water Quality Management Program require the preparation of an environmental assessment as part of the overall planning process. All plans and programs completed in response to the '208' Areawide Water Quality Management Program must include an environmental impact assessment which evaluates the environmental, social, and economic impacts of carrying out the plan. Floodplain impacts are considered in the environmental assessment.[59]

The environmental assessment is submitted by the designated '208' areawide planning agency to the Regional Office of the Environmental Protection Agency for review and approval. The '208' Areawide Water Quality Management Plan is submitted with the environmental assessment.

At this point, the '208' Plan is reviewed for compliance with the requirements of the National Environmental Policy Act concerning the preparation of an Environmental Impact Statement.[60] The Regional Administrator reviews the environmental assessment to determine if an Environmental Impact Statement is required. Environmental Impact Statements are prepared by the Regional Office of the Environmental Protection Agency, in cooperation with areawide, state and federal offices, if necessary.

The U.S. Environmental Protection Agency has developed a guidance manual entitled "Environmental Assessment of Water Quality Management Plans" (January, 1977) which suggests a model to be used to incorporate the environmental assessment process with the planning process.

Figure Four illustrates the suggested relationship of the '208' planning elements with the environmental assessment,

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[59] 40 Code of Federal Regulations, Section 131.11(p) and 40 Code of Federal Regulations, Section 6.214.

[60] 40 Code of Federal Regulations, Section 6.512(a).

FIGURE FOUR

RELATIONSHIP OF THE '208' AREAWIDE WATER QUALITY MANAGEMENT PLANNING PROCESS TO THE ENVIRONMENTAL ASSESSMENT PROCESS

PLANNING PROCESS	ENVIRONMENTAL ASSESSMENT
- Identify problems in meeting water quality goals of Section 101(a)(2) of the Act	
- Identify constraints and priorities	Identification of community goals and objectives related to environmental considerations
- Identify possible solutions	Preliminary assessment of possible environmental effects
	Collection of data
- Develop alternative plans	Detailed environmental assessment
- Assess alternative plans	Development of possible mitigation measures
	Public involvement to determine significance of environmental effects in relation to community goals and objectives
	Decisions on environmental impact
- Selection of an areawide plan	Documentation of the assessment

SOURCE: U.S. Environmental Protection Agency, *Environmental Assessment of Water Quality Management Plans*, January, 1977, p. I-8.

as contained in the Manual. It is anticipated that the Manual will be updated during 1978 in order to reflect new regulations from the Council on Environmental Quality pertaining to the National Environmental Policy Act.

The Manual provides detailed guidance concerning technical methods for assessing land use, environmental, social, and economic impacts. The importance of determining the effect of water quality plans and programs on growth and development is emphasized in the Manual. The effect of plans upon natural ecosystems is also emphasized. Specific guidance on evaluating ecological impacts in floodplains, however, is not included.

13. Coastal Zone Management Program

The Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, U.S. Department of Commerce requires that agencies receiving coastal zone management funding prepare an environmental impact assessment.[61]

The environmental impact assessment is considered to be an integral part of the overall planning process. Therefore, a number of the elements developed for a state's program can be used to meet requirements of the National Environmental Policy Act related to environmental assessments. The environmental impact assessment prepared by a state is used by the Office of Coastal Zone Management to prepare the Environmental Impact Statement, if such is needed.

The Coastal Zone Management Program is an environmental management planning program. Consideration of flood hazard areas and valuable floodplains is required during the development of State Coastal Zone Management Programs. Specific references on requirements related to floodplains or wetlands are not included in the environmental assessment sections of the Coastal Zone Management Program regulations. Regulations for the Coastal Zone Management Program also do not emphasize the identification of secondary development and growth which may be stimulated by coastal zone plans.

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[61] 42 Federal Register No. 167, Section 923.62, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, (August 29, 1977).

14. Assessment of Environmental Review Approaches

Each of the federal programs reviewed in this section includes specific provisions for completion of environmental assessments and Environmental Impact Statements. In all cases, these requirements are designed to meet requirements of the National Environmental Policy Act by providing environmental information for decision-making.

Most of the federal programs reviewed rely heavily on advisory guidance and technical assistance materials for directing the approach of grantees to environmental assessments. Regulations which must be followed by all grantees for the preparation of environmental assessments have only been promulgated for the following programs:

- '404' Permit Program - Army Corps of Engineers;
- '201' Waste Treatment Facilities Program - Environmental Protection Agency;
- '701' Comprehensive Planning Assistance Program - Department of Housing and Urban Development; and
- NPDES Permit Program - Environmental Protection Agency.

All federal agency programs reviewed in this section except the Coastal Energy Impact Program delegate major responsibilities for the approval of environmental assessments and environmental impact statements to regional, area, or district offices of the federal agencies. In all cases, the responsibility for review and approval of the environmental assessment and Environmental Impact Statement parallels the responsibility for project approval. This reflects the purpose of the National Environmental Policy Act; namely, to provide environmental information when program decisions are made.

Several additional points of comparison can be made among the environmental assessment approaches used by federal agencies:

- Degree to which environmental assessments are integrated in the program planning process;
- Degree to which the environmental assessment requirements emphasize secondary impacts from the projects; and the
- Degree to which a review of environmental impacts on the floodplain is required in the environmental assessment.

Figure Five indicates programs which have specific guidelines or regulations related to secondary development or floodplain impacts as part of their environmental assessment procedures.

The sections which follow address these points.

a. Integration of Environmental Assessments into the Program Planning Process

The National Environmental Policy Act mandates the consideration of environmental impacts at the earliest possible point in the planning process. All of the federal agency programs reviewed require some environmental information at the first point when the project is considered, either for initial funding or for approval of a detailed project plan. The type and detail of the environmental information required in all cases reflects the level and type of program decision to be made. For example, the Economic Development Administration requires that an Environmental Review be completed by the state program administrator prior to receiving a formal project proposal. More detailed environmental information is used later in project planning for a more intensive review of potential environmental impacts before construction grants are provided.

Although all programs provide for environmental assessments early in the planning process, environmental assessments are integrated into the program planning process to different degrees. The '201' Wastewater Treatment Works Program, the Urban Studies Program, and the

FIGURE FIVE

ENVIRONMENTAL ASSESSMENT REQUIREMENTS OF FEDERAL AGENCIES PERTAINING TO SECONDARY AND FLOODPLAIN IMPACTS

(Based upon a review of regulations, guidelines, and technical assistance materials)

	SECONDARY IMPACTS	FLOODPLAIN IMPACTS
Federal-Aid Highway Program (FHWA)	X	X
Urban Mass Transportation Program (UMTA)	X	X
Coastal Energy Impact Program (CCZM)	X	X
Urban Studies Program (ACE)		
Public Works Program (EDA)	X	X
Sewer and Water Facility Program (FMHA)		
'201' Wastewater Treatment Works Program (EPA)	X	X
Community Development Block Grant Program (HUD)		
'701' Comprehensive Planning Assistance Program (HUD)		
'404' Permit Program (ACE)	X	X
NPDES Permit Program (New Source) (EPA)	X	X
'208' Areawide Water Quality Management Program (EPA)	X	X
Coastal Zone Management Program (CZM)		

NOTE: Federal programs which provide guidance or regulations related to the identification of secondary development impacts or floodplain impacts as part of an environmental assessment are noted above. The table does not indicate the degree to which federal agency programs address floodplain impacts, since all environmental procedures are sufficiently broad to allow the identification of floodplain impacts if specific concerns are present.

'208' Areawide Water Quality Management Program are examples of programs where environmental assessment requirements are integrally connected with project planning.

Several of the programs reviewed do not have specific guidelines and regulations which address the question of the relationship of environmental assessments to other aspects of planning. In other cases, such as with the Federal-Aid Highway Program, the general need for environmental assessment for each stage of the highway planning process is noted.

b. Requirements for the Assessment of Secondary Development Impacts

Since many of the programs reviewed in this report affect floodplain development through secondary or indirect effects, the degree to which environmental impacts relate to secondary development impacts of projects is of central importance to the use of the environmental assessments for floodplain protection purposes.

The following programs emphasize the assessment of secondary impacts in the program guidance and regulations:

- Federal-Aid Highway Program;
- Urban Mass Transportation Program;
- Coastal Energy Impact Program (OCZM);
- Public Works Program (EDA);
- '201' Wastewater Treatment Works Program;
- '404' Permit Program; and
- NPDES Permit Program.

All programs have environmental assessment guidelines which are broad enough to permit the detailed review of secondary impacts if deemed necessary by the federal agency involved.

c. Requirements for Floodplain Impact Assessment

The types of resources reviewed through environmental assessments are primarily determined by the type of project and the location of the project or planning activity being reviewed. Nevertheless, in guidelines and regulations, federal agencies identify specific resources which should be considered in completing environmental assessments. The natural values of the floodplain are specifically noted in certain programs.

The following federal programs include specific provisions related to floodplain impact assessment in their regulations or guidelines:

- Federal-Aid Highway Program - Federal Highway Administration;
- Urban Mass Transportation Program - Urban Mass Transportation Program;
- Coastal Energy Impact Program - Office of Coastal Zone Management;
- Public Works Program - Economic Development Administration;
- '201' Wastewater Treatment Works Program - Environmental Protection Agency;
- '404' Permit Program - Army Corps of Engineers; and
- NPDES Permit Program (New Source) - Environmental Protection Agency.

Although the specific wording and emphasis of the regulations and guidelines vary among these agencies, they all involve an environmental assessment of impacts of the program on floodplains. It is expected that President Carter's Executive Order will be a major impetus to federal agencies to develop additional floodplain management provisions within the framework of environmental assessment requirements.

The examination of environmental assessment methods included in this report has not addressed the question of effectiveness of the approaches. Rather, this report represents a summary of program approaches which may be useful to the Environmental Protection Agency in controlling floodplain impacts related to the '201' Wastewater Treatment Works Program. In other chapters of this study, the applicability and potential usefulness of measures used by other federal agencies for the Environmental Protection Agency are identified.

CHAPTER FOUR

DECISION POINTS IN THE '201' WASTEWATER TREATMENT WORKS PROGRAM

A. Introduction

In previous chapters of this report, approaches and procedures used by certain federal agencies to reduce environmental impacts of planning and construction projects in floodplains have been described. Certain approaches or procedures found useful in other agencies may be of use to the U.S. Environmental Protection Agency in the administration of the '201' Wastewater Treatment Works Program.

The application of approaches and procedures used in federal programs to the '201' Wastewater Treatment Works Program, however, should be carefully related to the major decision points in the '201' Wastewater Treatment Works Program. The purpose of this chapter is to describe the major decision points in the '201' Program and assess their relationship to the reduction of floodplain impacts.

This chapter is organized into two major sections. The first section describes the major steps and decisions in the '201' Wastewater Treatment Works Program. The second section identifies the decisions which most frequently affect the impact of the treatment facility on floodplain resources. The final chapter of the report relates approaches and procedures used by other federal programs to the '201' Wastewater Treatment Works Program.

B. Description of the '201' Wastewater Treatment Works Program[1]

Section 201 of the Federal Water Pollution Control Act Amendments authorizes federal grants for the planning, design, and construction of wastewater treatment works. In accordance with the regulations developed to implement the Act, the U.S. Environmental Protection Agency (EPA) makes funds available to local agencies. Up to three-fourths of the eligible cost of waste treatment facility construction is paid for by the Environmental Protection Agency. Wastewater treatment facilities include wastewater treatment plants, pumping stations, separate structures, interceptor sewers, force mains, collection systems and outfalls. To date, the majority of the '201' Program funds have been used to construct waste treatment plants and interceptor sewers.

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[1] This section is based upon a review of '201' Program regulations, guidelines, and technical assistance materials. In addition, information was obtained through interviews with Mr. Ben Chen, Assistant Chief, Municipal Wastewater Program, Environmental Protection Division, Georgia Department of Natural Resources; Mr. Harry Desai, Southeast Area Coordinator, Region IV Office, U.S. Environmental Protection Agency; and Mr. David Word, Engineer, Municipal Wastewater Program, Environmental Protection Division, Georgia Department of Natural Resources.

The '201' Facilities Program is divided into three stages for administrative purposes. Each stage is called a step, as follows:

Step 1: Facility Planning;
Step 2: Engineering Design; and
Step 3: Construction.

Grants are available to assist local agencies in undertaking each of these steps. Each step involves a series of decisions and activities which are made by local agencies receiving the grants, state offices, or the Regional Offices of the U.S. Environmental Protection Agency.

The U.S. Environmental Protection Agency is responsible for administering the '201' Wastewater Treatment Works Program and has the final decision authority in reviewing the applications of local agencies for grant awards. State water pollution control agencies such as the Environmental Protection Division of the Georgia Department of Natural Resources are charged with the responsibility of reviewing '201' grant applications. The participation of state agencies in the administration of the '201' Program varies among states. In this chapter, approaches used in the Region IV Office of the Environmental Protection Agency (Atlanta, Georgia) are referenced.

Decisions and activities related to the '201' Program are described in four sections:

- Decisions and activities prior to the Step 1 grant;

- Decisions and activities during Step 1 (Facility Planning);
- Decisions and activities during Step 2 (Engineering Design); and
- Decisions and activities during Step 3 (Construction).

The sequence of the major decisions in the '201' Program is summarized in Figure Six.

1. Decisions and Activities Prior to the Step 1 Grant

Decisions made prior to the Step 1 grant which affect the location and potential environmental impact of waste treatment facilities include the preparation of the State Priority List, the delineation of the planning area boundary, and approval of a plan of study. Activities related to these decisions are described below.

Before a local agency may apply for a Step 1 grant, the proposal must first be placed on the State Priority List.[2] The Priority List is a ranking by each state of the proposed projects in order of their importance. In evaluating local government applications for waste treatment facility grants for the Priority List, states must consider the following:[3]

- The severity of water pollution problems;
- The existing population affected;
- The need for preservation of high quality waters;
- State identified category considerations;
- Innovative and alternative process considerations; and
- Any additional factors considered pertinent by the state.

The Priority List is submitted by a state to the Regional Office of EPA for final approval.

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[2] 40 Code of Federal Regulations, Section 35.915, as revised 43 Federal Register 188, September 27, 1978, which was issued after this report was substantially completed.

[3] U.S. Environmental Protection Agency, Handbook of Procedures, Construction Grants Program for Municipal Wastewater Treatment Works, p. II-7.

FIGURE SIX

'201' WASTEWATER TREATMENT WORKS PROGRAM - SEQUENCE OF MAJOR ACTIVITIES AND DECISIONS

Prior to Step 1

1. Approval of State Priority List
2. Delineation of preliminary project planning boundary
3. Approval of Step 1 application, including the plan of study
4. Step 1 grant award

Step 1 - Facility Planning

1. Determination of effluent limits (NPDES permit)
2. Assessment of present conditions
3. Assessment of future conditions
4. Development and evaluation of alternatives
5. Selection of Facility Plan
6. Preliminary design of treatment works
7. Arrangements for implementation
8. Summary of environmental impacts
9. Determination of need for an Environmental Impact Statement
10. Approval of Step 1 Facility Plan
11. Approval of Step 2 grant application
12. Step 2 grant award

Step 2 - Engineering Design

1. Preparation of design plans and specifications
2. Approval of design plans and specifications
3. Approval of Step 3 construction grant application
4. Step 3 grant award

Step 3 - Construction

1. Construction of facility
2. Final approval of sewer use ordinance, user charge system, and industrial cost recovery system
3. On-site inspection of construction

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After a local project is placed on the State Priority List, the state delineates, on a preliminary basis, the boundary of the planning area for the Facility Plan. The facility planning area should be large enough to analyze the cost-effectiveness of alternative methods of waste treatment and the environmental impacts of alternatives.[4] In determining the preliminary boundary, the state must pay attention to factors such as cost savings, management advantages, and environmental gains.[5] The planning boundary is reviewed by the EPA Regional Office after the Step 1 grant is awarded to the local agency and may be revised.

In applying for a Step 1 facility planning grant, the local agency must submit a Plan of Study with the Step 1 application. The local agency may request a pre-application conference with the state agency and with the EPA Regional Office to discuss the requirements for submitting a Step 1 application.[6] In the State of Georgia, the state agency usually calls for a pre-application conference when municipal facilities in major cities are involved.[7]

The Plan of Study must contain the following items:[8]

- Description of the proposed planning area;
- Description of the nature and scope of the proposed Step 1 project;
- Identification of entity or entities that will be conducting the planning; and
- Itemized description of the estimated costs of the project.

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[4] U.S. Environmental Protection Agency, Guidance for Preparing A Facility Plan, Washington, D.C., Revised, 1975, p. 4.

[5] 40 Code of Federal Regulations, Section 35.915(c)(1).

[6] Ibid., Section 35.920-2.

[7] Interview with Mr. Dave Word, Engineer, Environmental Protection Division, Georgia Department of Natural Resources.

[8] Ibid., Section 35.920-3.

The Plan of Study is reviewed and approved by the state agency and the EPA Regional Office for compliance with requirements.

2. Decisions and Activities During Step 1 (Facility Planning)

After a Step 1 grant is awarded by the Regional Office of the Environmental Protection Agency, a Facility Plan is prepared by the local agency. Typically, the Plan is prepared by a consulting engineering company working for the local agency. During this step, a determination is made of the size, capacity and site location of the facility.

The Facility Plan must include the following elements:[9]

- A description of waste treatment works for which plans and specifications will be prepared;
- A description of the selected waste treatment system;
- Infiltration and inflow documentation;
- Cost effectiveness analysis of alternatives for the waste treatment works and of the selected waste treatment system;
- Environmental assessment of alternatives for waste treatment works and of the selected waste treatment system;
- Identification of effluent limitations or a NPDES permit;
- Documentation of public hearings; and
- Required comments or approvals of relevant state, interstate, regional and local agencies.

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[9] *Ibid.*, Section 35.917-1.

As indicated in EPA's guidance for preparing a facility plan, a facility plan can be developed through seven major tasks:[10]

Task 1: Effluent Limitations

The effluent limitations, as included in a permit issued under the National Pollutant Discharge Elimination System, should be identified and considered as the first step in the facility planning process.

Task 2: Assess Current Situation

Existing conditions in the planning area, including environmental conditions and land use patterns, should be described for consideration in Task 4 when advantages and disadvantages of different alternatives are identified.

Task 3: Assess Future Situation

Since the facility planning period should extend twenty years beyond the date when the facility is scheduled for operation, future wastewater management needs over a twenty year time period must be identified. Projections of population and economic growth are also identified at this point.

Task 4: Develop and Evaluate Alternatives

The identification of alternatives for meeting the wastewater treatment needs, and the evaluation of the alternatives should then be completed. Alternatives should be evaluated and screened for their environmental impacts, including both beneficial and adverse primary and secondary environmental impacts. Primary impacts are effects directly related to the construction and operation of the treatment works. Secondary impacts are: (1) indirect or induced changes in land use and population patterns, and (2) other environmental effects resulting from land use and population growth. It is at this point in the '201' facility planning process that the location of facilities and the need to locate facilities outside of floodplains whenever practicable are considered.

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[10] U.S. Environmental Protection Agency, Guidance for Preparing a Facility Plan, Revised, May, 1975, pp. 5-17.

In addition to the environmental analysis, a cost effectiveness analysis is required in EPA regulations. The analysis includes a consideration of the facility size and capacity in relation to the service needs, an evaluation of alternative flows and waste reduction measures and an assessment of environmental impacts, among other requirements.[11]

Task 5: Select Plan

After the identification and evaluation of alternatives, the facilities to be chosen for design and construction phases of the '201' Program can be identified. The U.S. Environmental Protection Agency recommends that local agencies use a ranking procedure to make the final selection of the facility. Considerations recommended for inclusion in the ranking procedure include:[12]

- Environmental Effects: All significant primary and secondary effects should be weighed to derive a value judgment as to the net overall effect of each alternative relative to other plans. Alternatives which have secondary effects with a high potential for contravening an environmental or land use statute or regulation, or contravening a plan imposed by such statute or regulation should be ranked below those that do not.

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[11] 40 Code of Federal Regulations, Section 35.917-1. Other required elements of the cost-effectiveness analysis include an evaluation of improved effluent quality attainable by upgrading, an evaluation of the capability of each alternative to meet effluent limitations, provision for applying the best practicable waste treatment technology, and an evaluation of alternative means for the ultimate disposal of treated material.

[12] U.S. Environmental Protection Agency, Guidance for Preparing a Facility Plan, p. 26.

- Monetary Costs: Total costs should be the primary factor in determining the cost-effectiveness of the Plan.

- Implementation Capability: The ability of and agreement among the state, regional and local governmental units or management agencies to implement the alternatives should be weighed carefully. The feasibility of implementing grant conditions would also be considered.

- Other Considerations: Each Plan must meet applicable federal, state and local requirements, and design and reliability criteria.

It is the responsibility of each agency completing a Facility Plan to determine the relative importance of each of these considerations.

Regulations of EPA require that an adequate environmental assessment be an integral, though identifiable, part of any Facilities Plan. The information in the environmental assessment portion of the Facilities Plan provides the basis for the development of an environmental impact statement, if one is required. As a result, the environmental assessment must include a description of the existing environment without the project, a description of the future environment without the project, documentation of sources of information, evaluation of alternatives, environmental impacts of the proposed action, and steps to minimize adverse effects.[13] Therefore, information obtained at many steps in the facility planning process is used in preparing the environmental assessment. It may be useful to complete major portions of the environmental assessment as part of Task 5.

In the completion of an environmental assessment, both primary and secondary impacts of the alternatives must be described. The significance of land use impacts must be evaluated, based on current population of the planning area, population to be serviced by the '201' facility, percentage of the service area currently vacant, and plans for staging facilities. Special attention must be given to induced changes in population patterns and growth.[14]

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[13] 40 Code of Federal Regulations, Section 6.512a.

Structural or nonstructural measures which are available to mitigate or eliminate significant adverse impacts must also be identified in the environmental assessment. Structural provisions for reducing environmental impacts include changes in facilities design, size and location; nonstructural provisions include staging of facilities and the development and enforcement of land use regulations.[15]

The primary and secondary impacts of the alternatives and the selected Facility Plan should be summarized as part of Task 5.[16] Reflecting the requirements of the National Environmental Policy Act, special attention in the summary should be given to unavoidable adverse impacts, the relation between local short term uses of the environment and the maintenance and enhancement of long-term productivity, irreversible and irretrievable commitments of resources, and steps to minimize adverse effects. This summary is included at the end of the Facilities Plan.

Task 6: Preliminary Design of Treatment Works

At this step, preliminary engineering designs for the treatment works proposed for construction are prepared. Schematic diagrams of pipes and structures, basic flow data, and a summary of operation and maintenance requirements are included in this task.

Task 7: Arrangements for Implementation

Following the selection of a facility plan, present institutional arrangements are reviewed and a financial program developed for allocating treatment service costs among customers.

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[14] 40 Code of Federal Regulations, Section 6.512a(5).

[15] 40 Code of Federal Regulations, Section 6.512a(6).

[16] U.S. Environmental Protection Agency, Guidance for Preparing a Facility Plan, Revised - May, 1975, p. 16.

> Grant conditions are considered at this point, if appropriate. Special conditions such as phasing of the sewer service, project changes, improved land use planning, sewer use restrictions, and plan modifications are examples of special conditions which may be useful in mitigating secondary impacts.[17]

These tasks are recommended but not required by the U.S. Environmental Protection Agency.

Figure Seven summarizes considerations in the Step 1 facility planning process related to secondary development and floodplain impacts. Tasks 2 and 3, the assessments of the current and future situation, result in the collection of base data from which the impacts of facility alternatives can be determined. The focus of the environmental review, is in Task 4, when alternatives are identified and evaluated, and in Task 5, when the facility plan is selected. Secondary development effects are considered at the same time that environmental impacts, including floodplain impacts, are considered. Although EPA guidelines emphasize the consideration of environmental effects throughout the planning process, the focus for the environmental evaluation is when alternative facilities are evaluated.

When a Facility Plan is completed by a local agency, it is submitted to the appropriate state agency for review and certification. The state agency is required to certify that the Facility Plan meets the requirements of the '201' Program and that the Plan conforms with any existing Section 303(e) river basin plans for the facility area.[18]

Prior to the completion of a Facility Plan in the State of Georgia, there is extensive communication between the state water pollution control agency and the engineering firm that is developing the Facility Plan. If the engineering firm has questions about the identification of alternatives or the selection of the final alternative, the firm may contact the Environmental Protection Division of the Georgia Department of Natural Resources. Some engineering firms in

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[17] U.S. Environmental Protection Agency, Program Guidance Memorandum 75-76, "Consideration of Secondary Environmental Effects in the Construction Grants Process", (June 6, 1975).

[18] 40 Code of Federal Regulations, Section 35.917-7.

FIGURE SEVEN

CONSIDERATIONS IN STEP 1 FACILITY PLANNING PROCESS RELATED TO SECONDARY DEVELOPMENT AND FLOODPLAIN IMPACTS

The tasks listed below are suggested by the U.S. Environmental Protection Agency as guidance in the preparation of a '201' facility plan. The relationship of each task to secondary development and floodplain impact considerations is noted.

	Secondary Development Effects	Floodplain Impacts
Task 1: Effluent Limitations	-	-
Task 2: Assess Current Situation	Base data collected	Base data collected
Task 3: Assess Future Situation	Base data collected	Base data collected
Task 4: Develop and Evaluate Alternatives	Effects considered	Impacts considered
Task 5: Select Plan	Effects considered	Impacts considered
Task 6: Preliminary Design of Treatment Works	-	-
Task 7: Arrangements for Implementation	-	-

Georgia find it useful to provide office space for state agency staff, since contacts are so frequent.[19] Due to the large geographic area covered by the Region IV Office of the Environmental Protection Agency, extensive contacts and field visits are not usually possible. Region IV staff, however, are available for consultation concerning '201' Program regulations.[20]

In most areas, both state agencies and the EPA Regional Office participate in the Plan review process. Regional Offices are authorized to delegate certain aspects of the review to state agencies. The particular types of reviews carried out by state agencies, however, vary among states. Following the state review, the Facility Plan is forwarded to the EPA Regional Office for review and approval. Elements of EPA's review pertaining to environmental impacts are identified below.

EPA makes two determinations related to the environmental impacts of the proposed facility when the Facility Plan is reviewed. First, the Facilities Plan is reviewed to determine if proper mitigation measures have been taken to reduce the environmental impacts. Second, a determination is made as to whether the preparation of a draft Environmental Impact Statement is needed.[21]

In reviewing the environmental assessment, the EPA Regional Office may determine that the secondary impacts of the proposed facility will be contrary to federal, state or local environmental laws or regulations. If such a determination is made, the Regional Office has the authority to withhold approval of Step 2 or Step 3 grants until the applicant revises the Facility Plan or initiates steps to reduce adverse effects. Special grant conditions requiring actions to minimize adverse impacts may be required.[22]

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[19] Mr. Dave Word, Engineer, Environmental Protection Division, Georgia Department of Natural Resources.

[20] Mr. Harry Desai, Southeast Area Coordination, Water Division, Region IV, U.S. Environmental Protection Agency.

[21] U.S. Environmental Protection Agency, Handbook of Procedures, Construction Grants Program for Municipal Wastewater Treatment Works, p. IV-50.

[22] U.S. Environmental Protection Agency, Program Guidance Memorandum 75-26, (June 6, 1975).

If it is determined that no significant impacts will result from the proposed project, the Regional Office will issue a "negative declaration". An environmental appraisal is prepared to accompany the negative declaration. The environmental appraisal is a document which summarizes the project, including primary and secondary impacts, and explains why an environmental impact statement is not needed.

If the EPA Regional Office determines that the proposed project will have significant environmental effects or will have environmental impacts which are likely to be highly controversial, an Environmental Impact Statement (EIS) is prepared by the Regional Office before the Facility Plan is approved.

In cases where the EPA Regional Office has determined in advance that the facility that is being planned will have significant or controversial environmental impacts, a different EIS process is followed. In such cases, an agreement is made between the applicant, state agency and EPA Regional Office to prepare a Step 1 Facility Plan and an Environmental Impact Statement at the same time. This procedure, known as "piggy-backing", is intended to speed up the Facility Plan approval process.[23]

The approval of the Facility Plan is an important decision in the '201' Program. As previously described, environmental factors (including floodplain impacts and secondary impacts) are fully reviewed during Step 1.

Following the approval of the Step 1 Facility Plan, the local agency may prepare and submit a Step 2 grant application. The local agency must provide evidence that applicable federal regulations have been met, including participation in the National Flood Insurance Program.

The Step 2 application is submitted to the state agency and to the EPA Regional Office for review and approval.

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[23] U.S. Environmental Protection Agency, Office of Water Program Operations, How to Obtain Federal Grants to Build Municipal Wastewater Treatment Works, p. 16. (May, 1976).

3. Decisions and Activities During Step 2 (Engineering Design)

The local agency in most cases contracts with an engineering consulting firm for the development of the Engineering Design Plans and Specifications. However, it is the responsibility of the local agency to comply with the requirements of the '201' Program.

In the State of Georgia, engineering firms are encouraged to request assistance from the Environmental Protection Division of the Georgia Department of Natural Resources. This state agency has been granted the authority by the Region IV EPA Office to conduct a detailed review of the Facility Design Plans.[24]

After the completion of the Engineering Design Plans and Specifications, the local agency submits the plans to the state agency for review and certification. The Design Plans are then submitted to the EPA Regional Office for final review and approval.

After the approval of Step 2 Design Plans and Specifications, the local agency may submit an application for the Step 3 construction grant. In the Step 3 grant application, the local agency is required to provide the same assurances as in the Step 2 application.[25]

The Step 3 application is submitted to the state agency for review and approval. The approved application is then submitted to the EPA Regional Office for final review and approval. In reviewing the Step 3 application, the EPA Regional Office identifies special conditions which must be placed on the Step 3 grant. After the Step 3 grant is awarded, the local agency undertakes the actual construction of the facility.

4. Decisions and Activities During Step 3 (Facility Construction)

During Step 3, the actual construction of the wastewater treatment facility begins. By this time, the major decisions which affect the location and potential environmental impact of the facility have been made. The main review which the EPA Regional Office undertakes in Step 3 is the on-site inspection of the facility to make sure that the project is being constructed according to the approved plans and specifications.

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[24] "Joint EPA and State of Georgia Agreement for Review and Approval of Plans, Specifications and Other Documents Required Under the Federal Water Pollution Control Act", (October 15, 1976).

[25] 40 Code of Federal Regulations, Section 35.920-3(c).

In the payment of Step 3 grant funds to the local agency, the U.S. Environmental Protection Agency has established a policy that no more than 50 percent of the Step 3 grant may be paid to the local agency until progress toward the development of the user charge and industrial cost recovery systems is demonstrated.[26] No more than 80 percent of the Step 3 grant may be paid to the local agency until the EPA Regional Office has approved the established user charge system, the industrial cost recovery system and the sewer use ordinance.[27]

C. '201' Program Decisions Related to the Impact of Wastewater Treatment Facilities on the Floodplain

Detailed planning is undertaken prior to the construction of any wastewater treatment facility funded through the '201' Wastewater Treatment Works Program. During the course of facility planning, decisions are made which affect the impact of the facilities on floodplains. The purpose of this section is to identify the decision points in the '201' Program which now do or potentially can affect the impact of the treatment facility on vulnerable floodplain areas.

Policies of the U.S. Environmental Protection Agency reduce the impacts of '201' wastewater treatment facilities on floodplains. Wastewater treatment facilities are funded only in locations where there is an existing or projected need for wastewater treatment services. The U.S. Environmental Protection Agency will not approve treatment facilities which will stimulate or induce new residential, commercial, or industrial growth. In addition, it is the policy of the Environmental Protection Agency to identify and protect sensitive environmental resources, including floodplains.

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[26] U.S. Environmental Protection Agency, How to Obtain Federal Grants, p. 18-19, (May, 1976).

[27] Ibid.

Despite strong policies related to floodplain protection and secondary development, construction of wastewater treatment facilities can stimulate urban development. Because treatment plants and interceptors are usually located in or near floodplain areas for economic and engineering reasons, the potential for floodplain development is a concern.

In many areas, the availability of sewer and water service is a pre-requisite to urban development. In some cases, soils are not suitable for septic tanks, and development may be prohibited by state and local health laws which regulate the installation of septic tanks. In other cases, septic tanks may be used, but potential homeowners desire urban services such as sewer services.

As a result, the presence of sewer and water service increases land values and the potential for urban development. When land for development is purchased at a high price, owners and developers request subdivision approvals from local governments. Even though the treatment facility is planned to serve population growth in twenty years, the capacity of the treatment facility may allow for it to serve additional immediate growth. In cases where the construction of the facility is staged so that actual capacity is limited, developers may obtain subdivision approval and proceed with development in the expectation that the schedule for expansion of the plant can be accelerated.

In brief, simply the presence of a wastewater treatment facility in the vicinity greatly increases and enhances the potential for land development. Despite strong policies and control measures, funding by the U.S. Environmental Protection Agency can induce urban development in floodplains. Since many facilities are located in or near floodplains, the presence of the facility increases the potential for urban development in the floodplain.

The following types of decisions made during the '201' facility planning, design, and construction process can influence the effect of treatment facilities on the floodplain:

- Decisions related to the location of the facility: Because development often occurs around a treatment facility and interceptor, even though service to the land area is not anticipated, decisions related to the location of wastewater treatment facilities can influence floodplain impacts.

- Decisions related to the size, capacity and service area of the facility: Decisions related to the physical capacity and size of the treatment facilities, as well as the area serviced, affect growth and development. The '201' Program is administered so that planning and construction grants are available for projects to serve population growth expected in the next twenty years.

- Decisions related to staging of the facility and facility hookups: After the existing and projected population to be served has been determined, policies related to the staging of the construction and policies related to hookups to the facility after construction can be determined. Such policies can be used to control development in the floodplain.

The points in the '201' Program where these three types of decisions are made are identified in the sections which follow. The major planning and design activities are undertaken by local agencies, working in cooperation with state agencies and the U.S. Environmental Protection Agency. Final approval of all recommendations is the responsibility of the Regional Offices of the U.S. Environmental Protection Agency.

1. Decisions Related to the Location of the Facility

Consideration of the location of the facility occurs at two points in the '201' Program. Initially, prior to the approval of a Step 1 grant, the general location of the facility is identified. The preparation of the State Priority List and the selection of a preliminary project boundary serve to identify the general location of the wastewater treatment facility for purposes of planning.

Secondly, the specific location of the facility is considered during Step 1 facilities planning. When alternatives are evaluated, the locations of the alternatives and related environmental effects are considered. Environmental effects related to the alternative selected, including effects on development in the floodplain, are also considered when the Step 1 Facility Plan is reviewed for approval. If environmental impacts are believed to be significant, an environmental impact statement is prepared which provides for additional consideration of environmental impacts.

2. Decisions Related to the Size, Capacity, and Service Area of the Facility

Detailed planning for the size, capacity, and service area of the facility takes place during Step 1 of the '201' Program. The size, capacity, and service area of alternative treatment facilities is identified for several alternatives. This information is a necessary pre-requisite for the preliminary design of the treatment works which also takes place during Step 1. When the Step 1 Facility Plan is reviewed and approved by the U.S. Environmental Protection Agency, further consideration is given to size, capacity and service area.

3. Decisions Related to Facility Staging and Hookups

Decisions related to staging of the facility and facility hookups also focus on the Step 1 facility planning process. The Step 1 Facility Plan must identify ways to mitigate environmental impacts related to the facility. Staging of facility construction over time and policies related to hookups to facilities are major ways of mitigating environmental impacts related to urban development. When the U.S. Environmental Protection Agency reviews the Step 1 Facility Plan for approval, mitigation measures are considered. If an environmental impact statement is prepared, further consideration is given to the mitigation measures.

Implementation of the decisions related to staging and hookups may involve grant conditions on Step 2 and Step 3 grant awards. The major decisions, however, are typically made during Step 1.

The activities undertaken in the '201' Program related to decisions affecting floodplain development and environmental impacts are shown on Figure Eight. Many of the important decisions affecting all three factors focus on the Step 1 facility planning phase of the '201' Program.

FIGURE EIGHT

'201' PROGRAM ACTIVITIES AND DECISIONS RELATED TO FLOODPLAIN DEVELOPMENT AND ENVIRONMENTAL IMPACTS

'201' PROGRAM PLANNING, DESIGN, AND CONSTRUCTION ACTIVITIES	Decisions Related to Facility Location	Decisions Related to Size, Capacity, and Service Area	Decisions Related to Staging and Sewer Hookups
PRIOR TO STEP 1			
1. Approval of State Priority List	X		
2. Delineation of preliminary project planning boundary	X		
3. Approval of Step 1 grant application	X		
4. Step 1 grant award			
STEP 1 - FACILITY PLANNING			
1. Determination of effluent limits (NPDES permit)			
2. Assessment of present conditions			
3. Assessment of future conditions			
4. Development and evaluation of alternatives	X	X	X
5. Selection of Facility Plan	X	X	X
6. Preliminary design of treatment works		X	X
7. Arrangements for implementation			
8. Summary of environmental impacts			
9. Determination of need for an environmental impact statement			
10. Approval of Step 1 Facility Plan	X	X	X
11. Approval of Step 2 grant application	X	X	X
12. Step 2 grant award			

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FIGURE EIGHT (Cont'd)

	Decisions Related to Facility Location	Decisions Related to Size, Capacity, and Service Area	Decisions Related to Staging and Sewer Hookups
STEP 2 - ENGINEERING DESIGN			
1. Preparation of design plans and specification			
2. Approval of design plans and specifications			
3. Approval of Step 3 construction grant application			X
4. Step 3 grant award			
STEP 3 - CONSTRUCTION			
1. Construction of facility initiated			
2. Approval of sewer use ordinance, user charge system, and industrial cost recovery system (prior to 80% funding)			
3. On-site inspection and approval of construction			

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CHAPTER FIVE

FLOODPLAIN IMPACT MITIGATION MEASURES APPLICABLE TO THE '201' WASTEWATER TREATMENT WORKS PROGRAM

A. Introduction

Chapter Two of this report identified floodplain impact mitigation measures used in federal programs. Certain programs protect the floodplain from development impacts while other programs potentially can alter floodplains.

Programs which can potentially alter floodplains use three types of measures to reduce floodplain impacts. Several programs require state or local governments to adopt land use regulations in response to environmental plans. Another type of mitigation measure is the policy approach, which involves the implementation of agency floodplain policies through planning and design requirements or through grant conditions. The dominant measure used, however, is the use of the environmental assessment as an "early warning system" for identifying potential floodplain impacts. In some cases the identification of adverse impacts on floodplains leads to changes in project proposals.

Chapter Three described steps in the '201' Wastewater Treatment Works Program and identified the key decisions where floodplain impacts are, or potentially can, be effectively considered. Decisions which have major effects on the location of the facility; the capacity, size and service area of the facility; or facility staging and hookups are of importance for mitigating floodplain impacts.

The purpose of this chapter is to relate the findings of Chapter Two concerning floodplain impact mitigation measures used by federal agency programs to the '201' Program of EPA. The following information is included in this chapter:

- Identification of floodplain impact mitigation measures used by other federal programs which can be applied to the '201' Program; and

- Identification of stages in the '201' Program where coordination with other federal programs should be undertaken for purposes of reducing adverse effects of treatment facilities on the floodplain.

This report is background information for a series of case studies concerning floodplain development pressures created by federal programs. Based upon the findings from the case studies as well as this report, recommendations to EPA concerning the mitigation of floodplain development impacts related to the '201' Wastewater Treatment Works Program will be made.

B. Floodplain Impact Mitigation Measures Used by Other Federal Programs Which Can Be Applied to the '201' Program

Federal programs use three types of approaches for identifying and reducing or mitigating program impacts on floodplains. The measures include land and water use regulations; floodplain management policies; and environmental assessment procedures.

The '201' Wastewater Treatment Works Program uses each type of mitigation measure. Consequently, the main concern is not the addition of new types of floodplain impact mitigation measures to the '201' Program, but rather the manner in which floodplain impact mitigation measures are used. It is possible that approaches used by certain federal agencies could provide useful models or examples for the '201' Program.

The applicability of federal program approaches for regulations, policies, and environmental assessments are reviewed in separate sections below.

1. Federal, State, and Local Regulations

The use of land and water use regulations as a tool for environmental protection at the federal, state and local level is one important type of floodplain impact mitigation measure used by federal agency programs.

Two federal regulatory programs, the NPDES Permit Program administered by the U.S. Environmental Protection Agency and certain states and the '404' Permit Program administered by the U.S. Army Corps of Engineers are programs which protect floodplains from certain types of environmental impacts. The NPDES Program regulates the discharge of wastewaters from industrial sources and municipal treatment facilities. However, the secondary impact of the facility on the floodplain is not usually considered in granting a permit.

The '404' Program prevents the alteration of wetlands or disposal of dredged materials in wetlands unless certain environmental conditions are met. This Program provides for the direct protection of sensitive wetlands, although it does not regulate the entire floodplain.

Two other federal programs, the Coastal Zone Management Program of the U.S. Department of Commerce and the '208' Areawide Water Quality Management Program of the U.S. Environmental Protection Agency require the development of state or local land and water use regulations. Local and state ordinances, laws, or permit programs developed as a result of these programs may provide for the environmental protection of floodplains. Although the Coastal Zone Management Program and the '208' Areawide Water Quality Management Program are environmental management planning programs, neither Program requires the regulation of floodplains for environmental purposes.

The National Flood Insurance Program, however, does require local communities interested in becoming eligible for flood insurance to adopt floodplain regulations. Although the primary purpose of the local government regulations is to provide for the protection of property and lives, floodplain regulations often also serve to protect sensitive natural areas.

If the combination of local, state, and federal regulatory programs directed development away from sensitive areas in floodplains, the U.S. Environmental Protection Agency would not be concerned about the secondary impact of wastewater treatment facilities on floodplains. Unfortunately, this is not the case.

The two programs which most directly result in the control of floodplain development are the '404' Program; and the National Flood Insurance Program. The '201' Wastewater Treatment Works Program is presently coordinated with these two Programs. It is the policy of the U.S. Environmental Protection Agency to require agencies undertaking '201' facility planning to comply with these and other federal program requirements prior to the construction of a wastewater treatment facility.

Federal, state, and local regulations affecting the location of the facility must be reviewed during the Step 1 facility planning process. Proposed facilities must be in conformance with all existing environmental and land use regulations.

The full impact of enforcement provisions of local government regulations, however, varies among communities. Therefore, the coordination does not, in all cases, reduce the impacts of wastewater treatment facilities upon floodplains.

2. Policies Related to Floodplain Protection

The Federal-Aid Highway Program administered by the Federal Highway Administration and the Sewer and Water Facility Loans and Grants Program administered by the Farmers Home Administration implement special policies related to the protection of sensitive floodplain areas. Floodplain policies are also part of the '201' Wastewater Treatment Works Program.

Floodplain policies can be implemented by these agencies in three ways. First, policies are used as guides when project proposals are reviewed. Second, the policies are used by project sponsors in preparing plans and engineering specifications. Finally, policies can be referenced as conditions on grants for project planning and construction.

President Carter's Executive Order on Floodplain Management establishes a uniform policy for federal programs. Agencies are now in the process of identifying methods for implementing the Executive Order. It is expected that the adoption of procedures to implement the Executive Order will, in effect, extend the "policy approach" to many other federal programs.

3. Environmental Assessment Procedures

In response to requirements of the National Environmental Policy Act, federal agencies have developed procedures for the identification of environmental impacts and the consideration of the impacts when project decisions are made. Most agencies depend upon the environmental impact review procedures as the major method for identifying adverse impacts from proposed projects which would affect floodplains.

The procedures followed by federal agencies for the preparation and review of Environmental Impact Statements are fairly uniform, since they are detailed in regulations of the Council on Environmental Quality for implementation of the National Environmental Policy Act. In order to identify environmental factors at an early stage in the planning process and in order to determine whether the preparation of an Environmental Impact Statement is needed, environmental assessments are prepared. Approaches and requirements related to environmental assessments vary among federal agencies.

Chapter Two of this report summarized the environmental assessment procedures of selected federal programs which alter or protect floodplains. Environmental assessment procedures included in the Federal-Aid Highway Program and the Public Works Program are potentially applicable to the '201' Wastewater Treatment Works Program of the U.S. Environmental Protection Agency. Environmental assessment approaches which may be useful to the U.S. Environmental Protection Agency are summarized below.

a. Federal-Aid Highway Program

The Federal-Aid Highway Program, administered by the Federal Highway Administration of the U.S. Department of Transportation, funds the construction of major highways which are sometimes located in floodplain areas. The review of environmental impacts is required at every stage in the highway planning process, including the system planning stage (regional analysis), the location stage, and the design stage. If a determination is made at any stage that the proposed project will have significant environmental impacts, an Environmental Impact Statement is prepared.

This approach may be compared to the '201' Wastewater Treatment Works Program which requires the preparation of an environmental assessment early in the planning process when a Step 1 Facility Plan is being prepared. If the Federal-Aid Highway Program approach were directly applied to the '201' Program, environmental assessment would be completed prior to Step 1, during Step 1 facilities planning, and during Step 2 engineering and design preparation.

The Federal-Aid Highway Program process, however, relates to more than the planning of the individual highway. To review the parallel process for wastewater treatment works, the '208' Program and the '201' Program must be considered together. When this is done it is apparent that EPA and the Federal Highway Administration are really following similar approaches. Environmental assessment requirements for the '208' Program parallel the system planning stage and location stage of the highway planning process. The location stage and the design stage relate to the '201' Program. The apparent difference between the environmental assessment process in the two programs is not a real one.

b. Public Works Program

The Public Works Program of the Economic Development Administration (EDA), U.S. Department of Commerce funds facilities which provide local employment benefits. The Program uses a three-step environmental assessment procedure. First, the applicant for a grant provides factual information related to the environmental impact of the project. Second, the state representative of EDA completes an environmental assessment using a checklist. Finally, a more extensive and detailed environmental assessment of the proposed project is completed by the Regional Office of EDA. For some projects, the Washington Office of EDA reviews the environmental assessment.

This multi-step process could be implemented by the Environmental Protection Agency for the '201' Program. It would, in effect, transfer major responsibilities for environmental impact assessment from the applicant to EPA. This approach would be most useful if environmental assessments completed by applicants for facility grants (or their consultants) are of uneven quality or if environmental information becomes available in a sequential fashion as the program is developed.

Whether these approaches would serve to improve environmental assessments and reduce the impact of facilities on floodplains cannot be determined until a review of the relationship of the '201' Wastewater Treatment Works Program to floodplain development has been made.

C. Coordination of the '201' Wastewater Treatment Facility Program with Other Federal Programs

Coordination between the '201' Wastewater Treatment Works Program and other federal programs could help to reduce the potential for adverse impacts on floodplains in two ways. First, the exchange of information, requirements, and technical approaches among federal agencies often leads to better programs within each agency. The ongoing work of the Water Resources Council to coordinate federal agency approaches for the implementation of President Carter's Floodplain Management Executive Order is an example of such coordination.

The second purpose in coordinating programs is to link programs together so that federal funds are more effectively utilized and federal policies implemented. For floodplain management purposes, for example, it may evolve that one federal program is capable of identifying critical floodplain areas where federal facilities should be avoided. In such cases, it would be appropriate for EPA and other federal agencies to use those critical floodplain areas as a checkpoint in project planning. There would be no need for separate identifications of critical areas by each program. The effort of the Department of Housing and Urban Development through the Flood Insurance Program to provide a clear definition of floodplains is an example of such an approach.

At present, the '201' Wastewater Treatment Works Program is linked with other federal programs in two ways. First, certain planning programs, such as the '701' Comprehensive Planning Program, the Urban Studies Program, The Coastal Zone Management Program, and the '208' Areawide Water Quality Management Program are undertaken prior to initial facilities planning through the '201' Program. Second, several federal programs provide funds which may be used by local agencies to match '201' Program funds for the construction of wastewater treatment facilities. Programs which are linked to the '201' Program in these ways are reviewed below.

Planning programs which may provide a basic identification of wastewater treatment facility needs in a community, including the identification of general locations for treatment facilities, include:

- '701' Comprehensive Planning Program, U.S. Department of Housing and Urban Development;
- Urban Studies Program, U.S. Army Corps of Engineers;
- Coastal Zone Management Program - Office of Coastal Zone Management, U.S. Department of Commerce; and
- '208' Areawide Water Quality Management Program, U.S. Environmental Protection Agency.

Of these programs, the Urban Studies Program and the '208' Areawide Water Quality Management Program are most likely to provide specific information concerning wastewater treatment facilities needs and the impacts of the facilities on floodplains.

Since each Urban Study is a unique water resources study for a metropolitan area, wastewater treatment facility needs will not be addressed in each case. Federal regulations, however, direct '208' Areawide Water Quality Management Programs to address treatment facility needs.

Each '208' Program must identify wastewater treatment facility needs for a twenty year period, including plans for the phasing of the treatment facilities. Typically, '208' Plans will identify growth trends and relate recommended facilities to those needs. The environmental impacts of each '208' Plan are reviewed as part of the planning process.

As envisioned by the drafters of the Federal Water Pollution Control Act Amendments, '208' Areawide Water Quality Management Plans were to provide the framework for more detailed waste treatment facilities planning completed through the '201' Wastewater Treatment Works Program. However, because the '201' Wastewater Treatment Works Program was funded prior to most of the '208' Areawide Water Quality Management Programs, many treatment works have been planned apart from '208' areawide plans. As a result, EPA has directed agencies undertaking '208' planning to incorporate ongoing '201' facility plans and programs directly into the '208' plans being prepared.

In the future, with a reversed sequence of planning, it is expected that '208' areawide planning programs will participate actively in the identification of locations and service areas of new waste treatment facilities. Because of the comprehensive scope of '208' planning programs, '208' Plans should be able to identify all water quality impacts of treatment facilities, including effects on runoff.

The degree to which '208' areawide planning programs will identify the secondary development impacts of treatment facilities located in floodplain areas, however, is uncertain. Overall, '208' planning programs have not investigated floodplain development problems. However, President Carter's May 1977 Executive Order for Floodplain Management is expected to result in new program procedures applicable to '208' Plans. It is possible that the identification of floodplain impacts, including secondary impacts resulting from wastewater treatment facilities will be included in '208' Plans.

The second type of program linkage relates to joint funding of a single wastewater treatment works project by several federal agencies. Typically, the U.S. Environmental Protection Agency will fund a major portion of a project. In some cases, local management agencies may obtain matching funds from other agencies, such as the Farmers Home Administration or through Community Development Block Grant funds. All regulations of the U.S. Environmental Protection Agency must be followed for such projects. Since the U.S. Environmental Protection Agency serves as the key funding and review agency, it is unlikely that floodplain impact mitigation approaches used by other federal programs will be of assistance through this type of coordination.

In conclusion, coordination between the '208' Areawide Water Quality Management Program and the '201' Wastewater Treatment Works Program is potentially of the greatest use for facilitating the review and mitigation of floodplain impacts resulting from treatment facilities. Such coordination is mandated through the Federal Water Pollution Control Act Amendments of 1972, although the sequence of program funding has not made it possible to implement the law as originally intended.

The question, however, is whether reliance on the '208' Program for the identification of floodplain impacts is the most effective way of reducing impacts from treatment facilities. The U.S. Environmental Protection Agency presently uses other administrative tools in the '201' Program for identifying and reducing impacts. An assessment of the sequence of federal programs and their effect on floodplain development as well as recommendations to the U.S. Environmental Protection Agency will be made in future portions of this study.